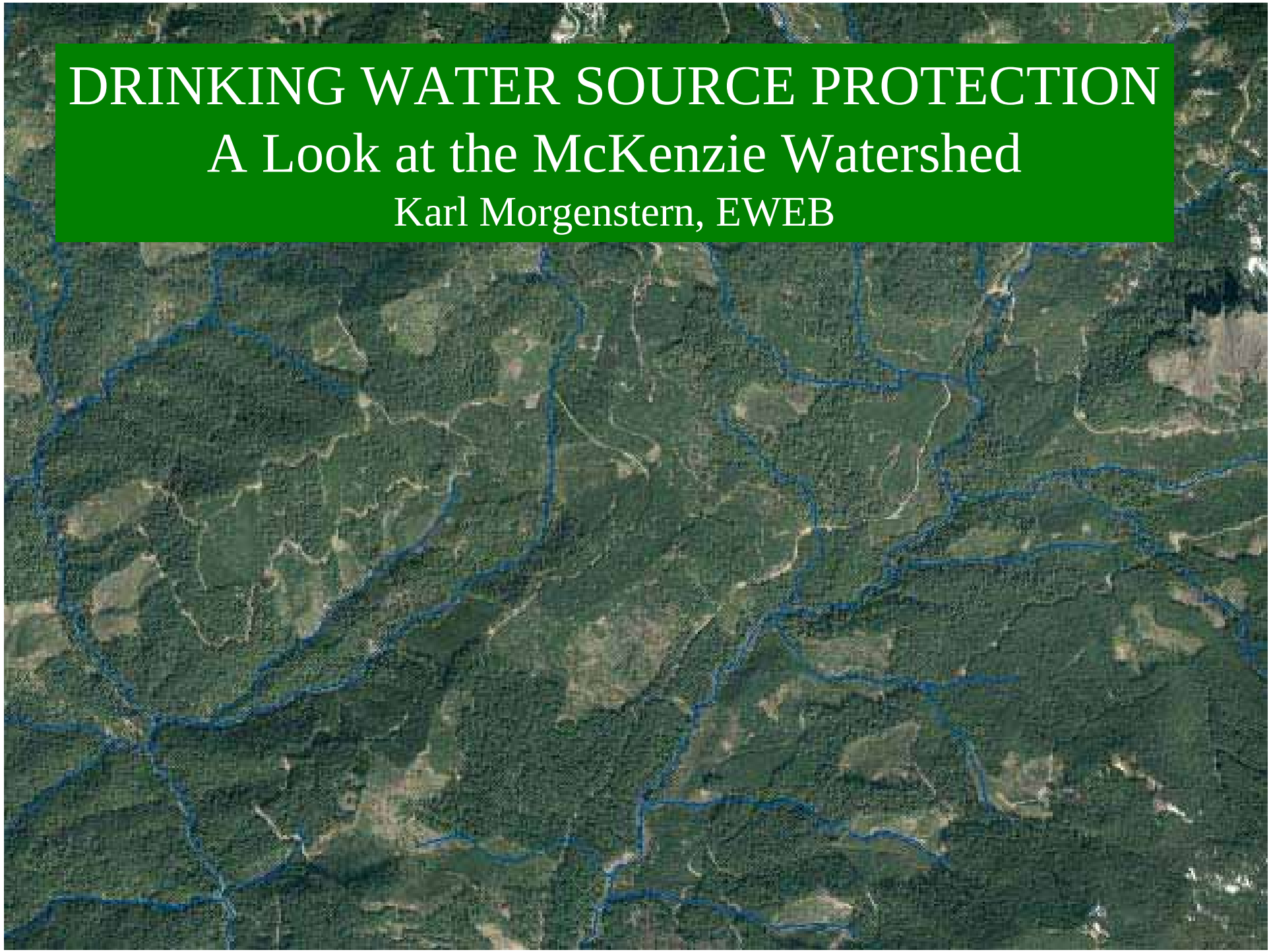


DRINKING WATER SOURCE PROTECTION

A Look at the McKenzie Watershed

Karl Morgenstern, EWEB

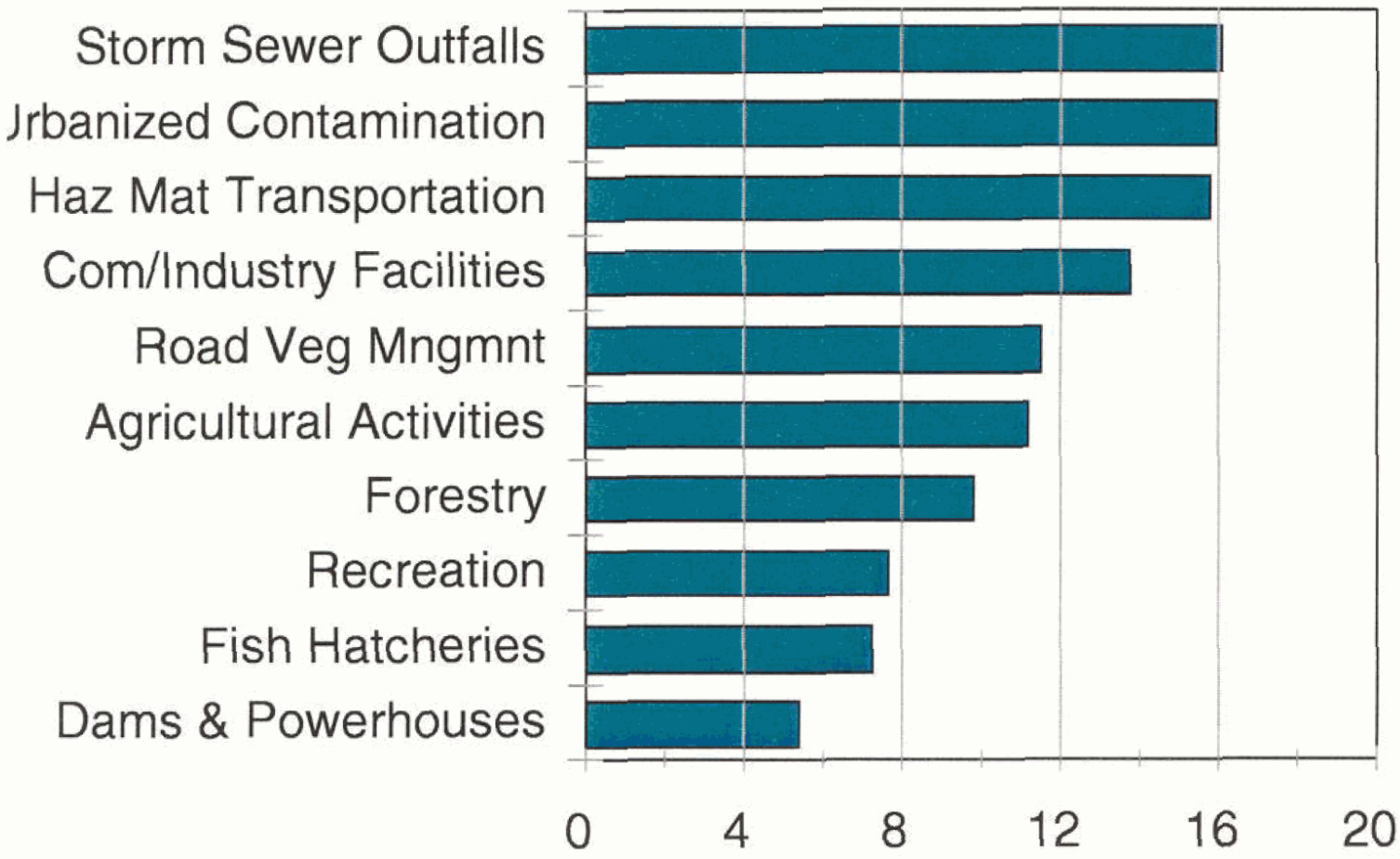
SUMMARY

- Overview of EWEB's source protection program.
- The Good.
- The Unfortunate.
- The Future.

Drinking Water Source Protection Plan

- Goal: Protect the McKenzie River as a reliable source of excellent drinking water for present and future generations.
- Objectives:
  - To prevent, minimize, and mitigate activities that have known or potentially harmful impacts on source water quality.
  - To promote public awareness and stewardship of a healthy watershed ecology in partnership with others.

RISK CATEGORIES RANKED BY AVERAGE SCORE



Source Protection Program Objective

- To measure the balance between watershed health and human use over time and to implement actions that maintain a healthy balance for production of exceptional water quality.

Elements of Source Protection Program

- Comprehensive Monitoring
- Disaster Preparedness and Response
- Point Source Evaluation and Mitigation
- Nonpoint Source Evaluation and Mitigation
- Education and Research Assistance
- Land Acquisition
- Watershed Land Use Tracking and Management
- Public Outreach and Information Sharing

A Closer Look At The Threats

- Urban Runoff/Industry/Stormwater
- Chemical Spills/Terrorism/Wildfire
- Roadside Vegetation Management
- Agriculture
- Forest Management Activities
- Septic Systems
- Construction/Development Activities
- Climate Change

General Theme

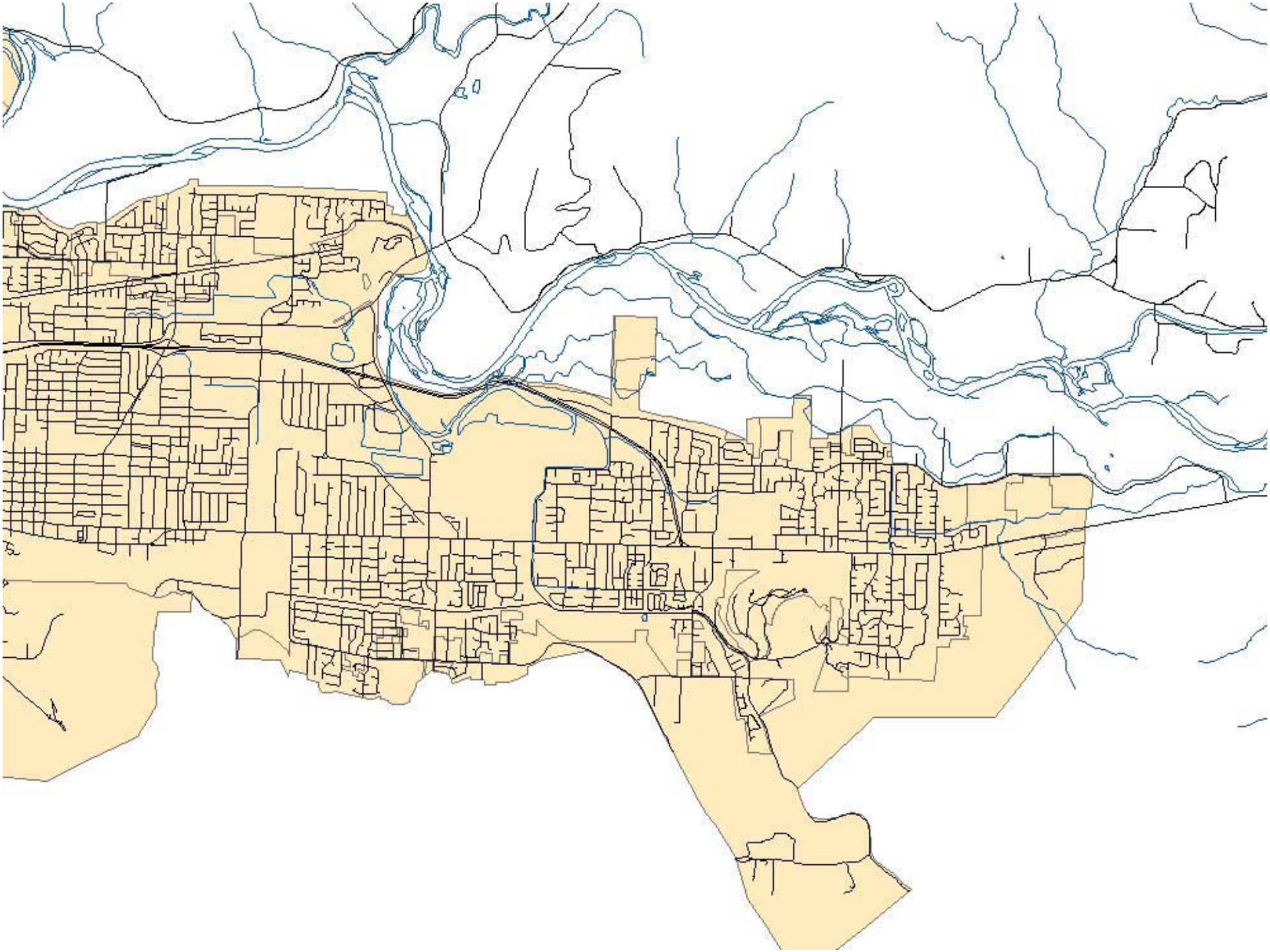
- Reach-out to agencies, landowners, stakeholders, academia to solicit feedback, identify opportunities, and develop long-term relationships.
- Conduct a detailed assessment to better understand the potential threat.
- Focus on areas where the activity poses the highest relative threat.
- Establish monitoring (or other) program to evaluate focus areas.
- Use monitoring and/or other data to focus mitigation and other source protection efforts.

Urban Runoff & Industry

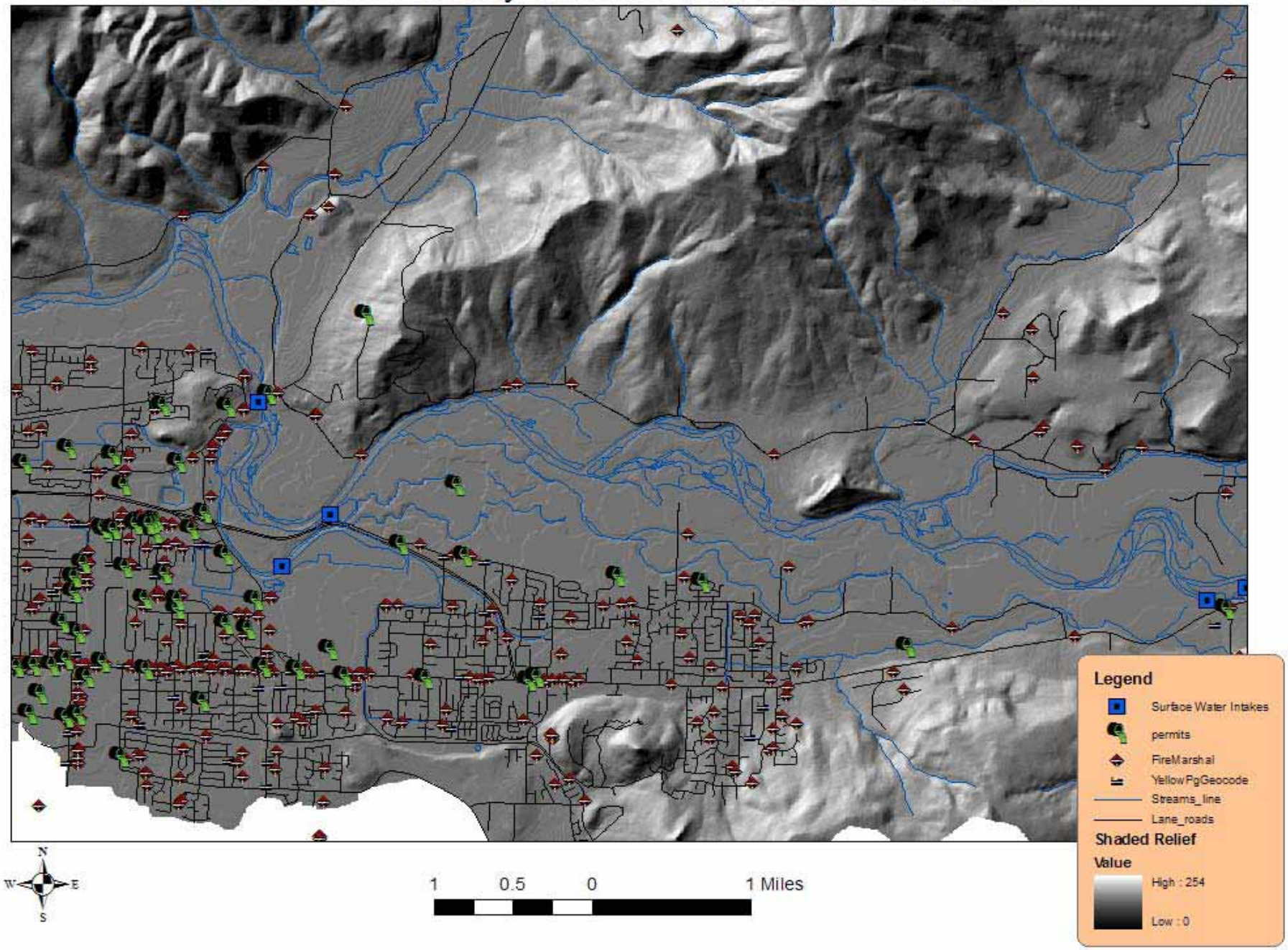
- Highest threat to drinking water.
- Located in lower watershed immediately upstream of intake.
- Consistently produces highest pollution loads.
- Storage of large quantities of hazardous materials near river.

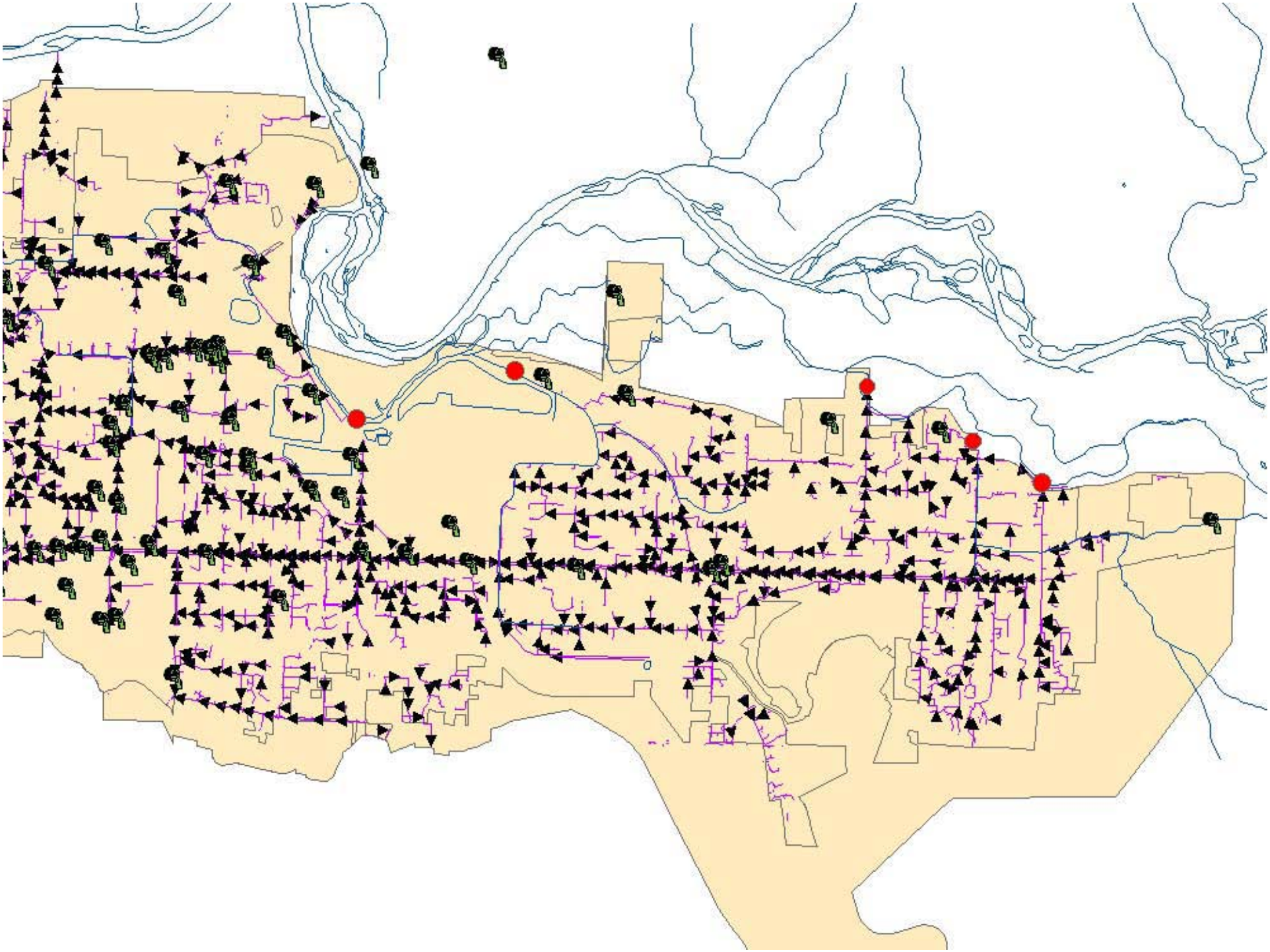
Urban Runoff Partnerships

- U.S. Army COE
- City of Springfield
- City of Eugene
- Oregon DEQ
- U.S. Geological Survey
- Lane Regional Air Pollution Authority
- SUB
- U.S. EPA
- Springfield School District
- Oregon State University
- McKenzie Watershed Council
- Lane Council of Governments
- Lane County

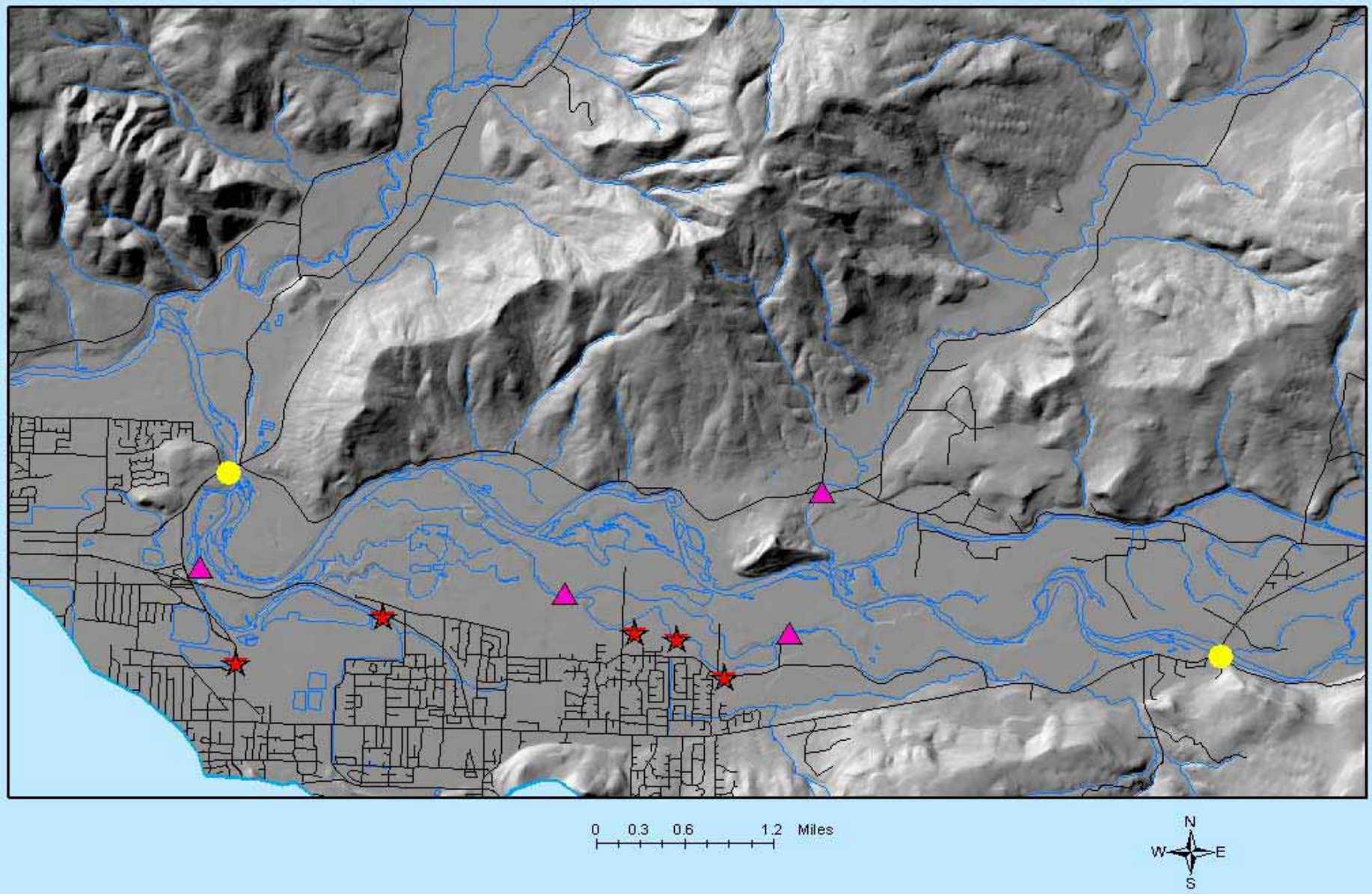


Location of Industry in Lower McKenzie Watershed





Storm Event Monitoring Locations

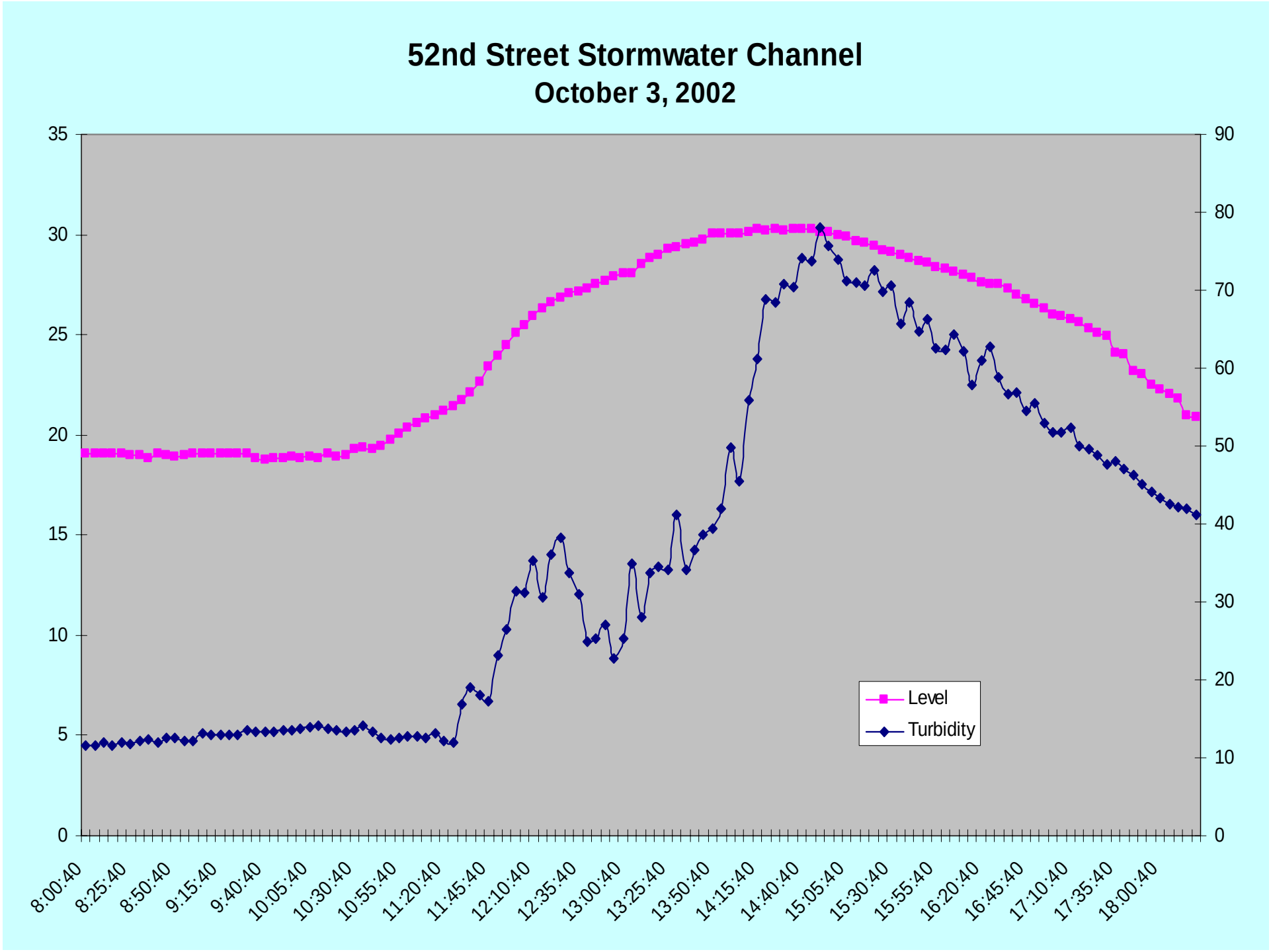


Approach to Urban Monitoring

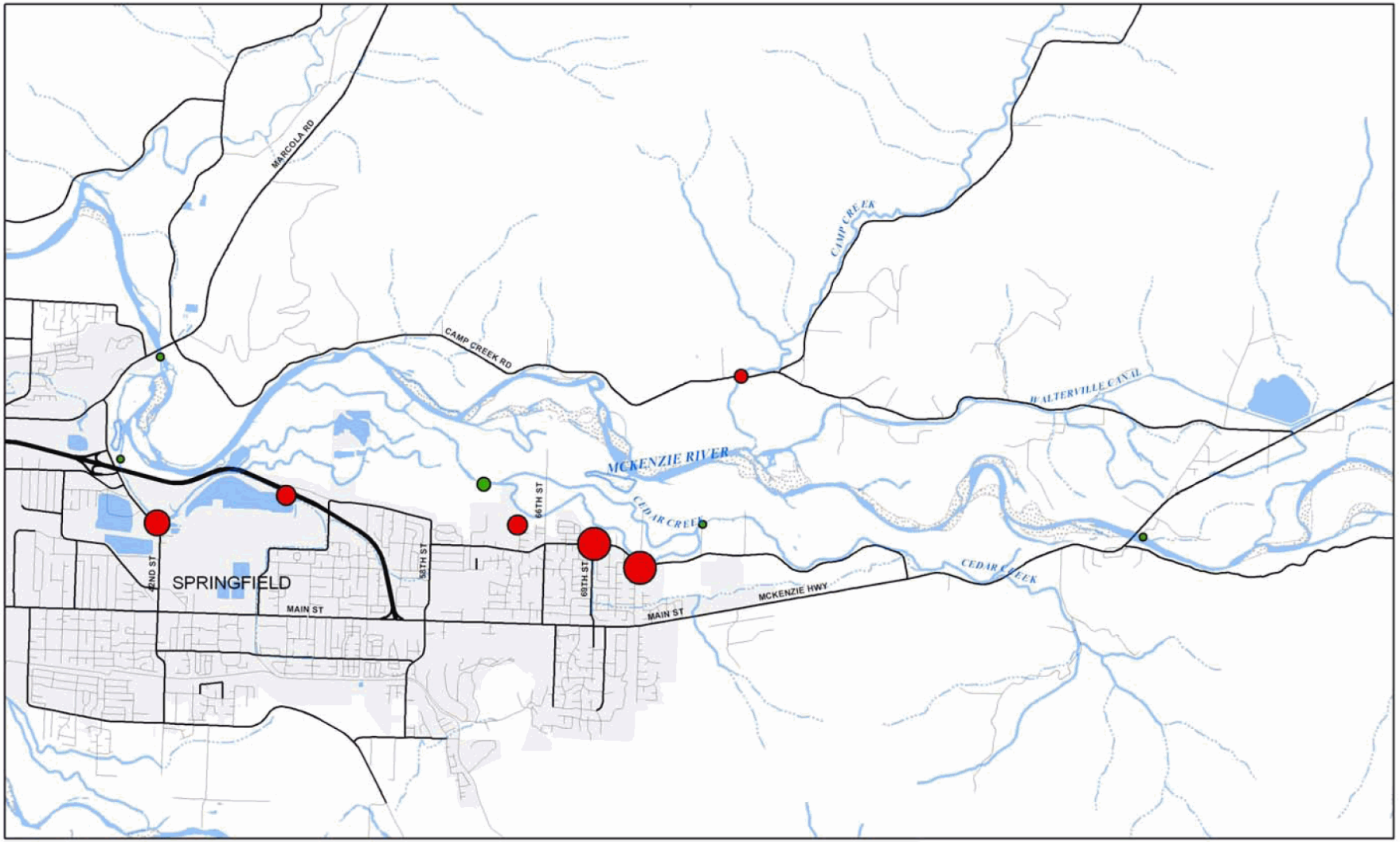
- Encourage and use existing monitoring programs (DEQ, MWC, SSD, LRAPA, SUB, EWEB-HB).
  - Fixed interval monitoring (i.e., monthly, quarterly).

- Implement storm event monitoring to augment fixed interval monitoring.
  - 70 to 90% of pollution loadings to surface waters occur during storm runoff events.

Storm Event Equipment


52nd Street Stormwater Channel
October 3, 2002
35
30
25
20
15
10
5
0
90
80
70
60
50
40
30
20
10
0
8:00:40
8:25:40
8:50:40
9:15:40
9:40:40
10:05:40
10:30:40
10:55:40
11:20:40
11:45:40
12:10:40
12:35:40
13:00:40
13:25:40
13:50:40
14:15:40
14:40:40
15:05:40
15:30:40
15:55:40
16:20:40
16:45:40
17:10:40
17:35:40
18:00:40
Level
Turbidity

October 2002 Storm Event Monitoring Results: E. Coli



Measured Value: E. Coli (Units = MPN/100ml)

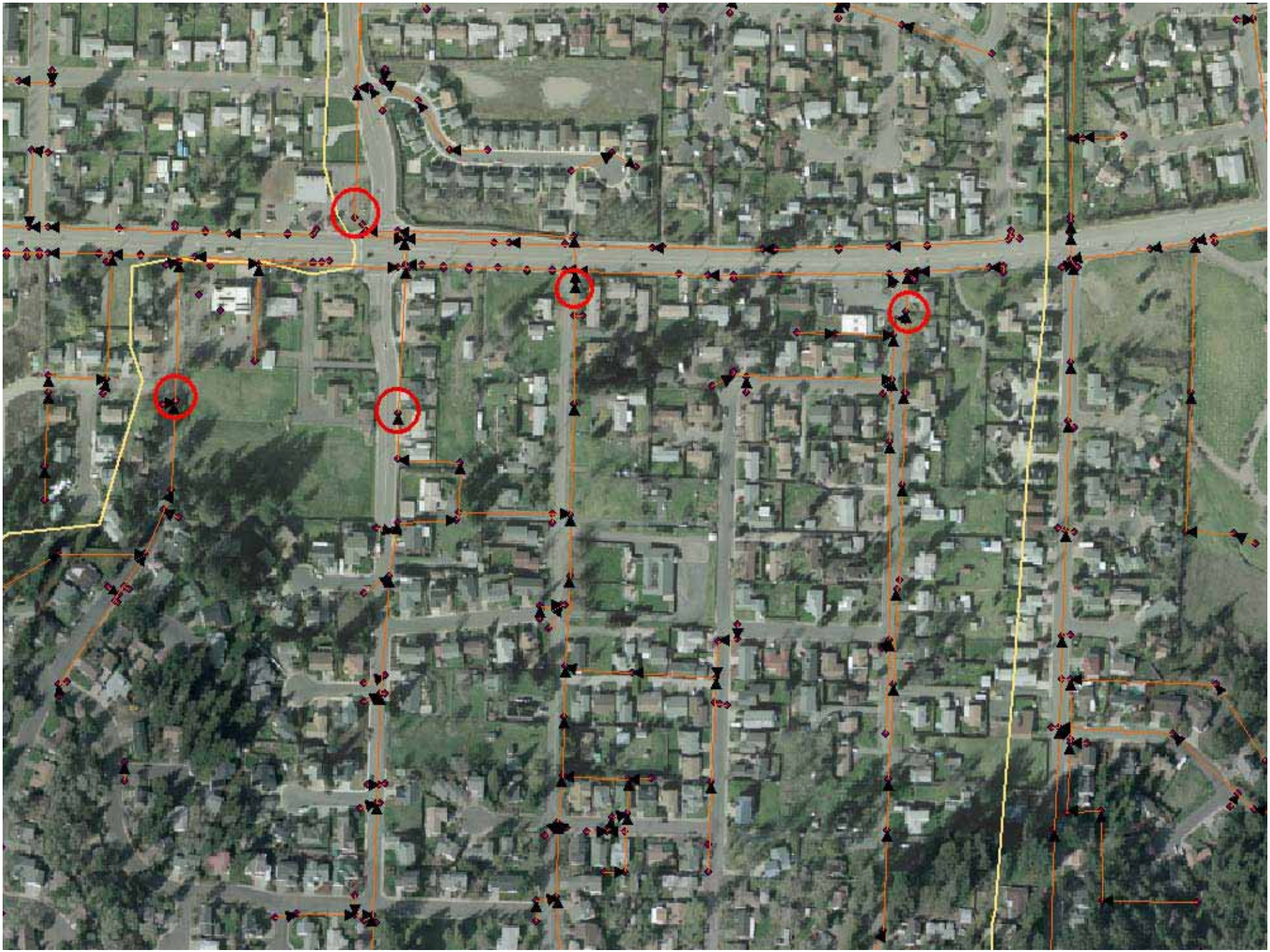
38 - 201
202 - 921
922 - 3970
3971 - 6910
6911 - 11200

Colors represent average baseline value compared with benchmarks (benchmark value):

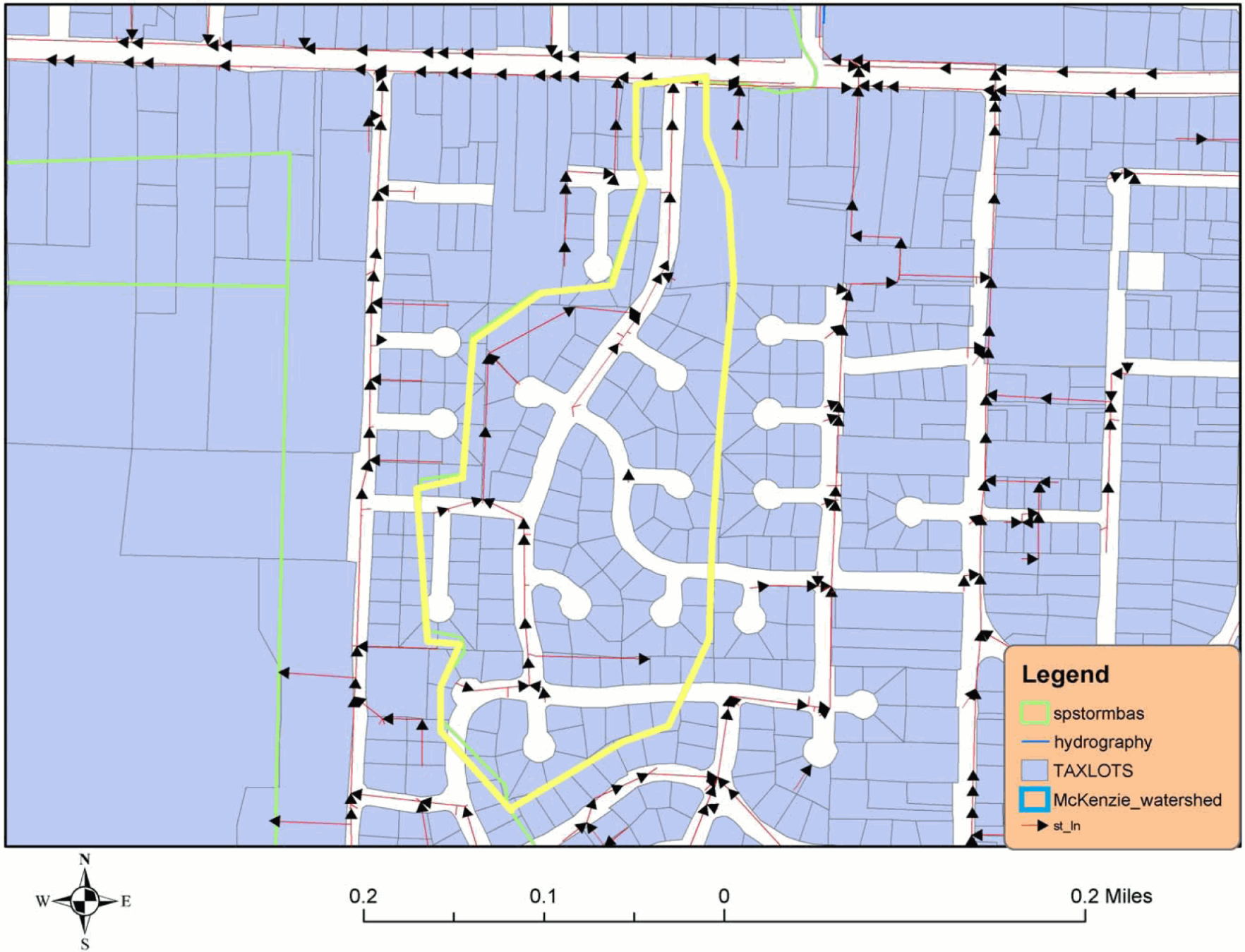
- Did Not Exceed Benchmark
- Exceeded Aquatic Toxicity - Chronic (There are no AT benchmarks for E. Coli)
- Exceeded Aquatic Toxicity - Acute
- Exceeded Human Health Benchmark (406 MPN/100ml)

N

0 0.25 0.5 1 1.5 2 2.5 Miles



68th Street Stormwater Subbasin - Bacteria Hot Spot



Efforts Related to Industry

- Implemented an Ecobiz program to certify auto shops as eco-friendly (8 agency partnership).
- Implemented multi-agency spill response system.
- Implementing LEPC Community Assessment process to evaluate EHS facilities.
- Track discharge permit renewals for input.
- Support SUB's wellhead protection program.

What has the USFS/BLM Got to do with this?

- The Good: Active participant in the watershed spill response program.
- The Unfortunate: Have historic sites with releases of hazardous materials.
- The Future: Look at having USFS & BLM vehicle maintenance facilities eco-certified.

Participating Agencies

- McKenzie Fire & Rescue
- McKenzie Watershed Council
- Mohawk Rural Fire
- Upper McKenzie Rural Fire
- Springfield Fire & Life Safety
- Springfield Public Works
- Springfield Environ Srvcs
- Eugene Fire & EMS
- Lane County Public Works
- Lane County Public Health
- Lane County Sheriff
- Springfield Utility Board
- Rainbow Water District
- Region 2 HazMat Team
- Lane Council of Governments
- Lane Air Pollution Authority
- Oregon DEQ
- Oregon Health Division
- Oregon DOT
- Oregon Fish & Wildlife
- Oregon State Police
- Oregon Water Master
- Weyerhaeuser
- US EPA
- Army Corps of Engineers
- US Forest Service
- US BLM

Threat Assessment

- Purpose is to identify most probable chemical threat from transport, storage, and use in watershed.
- Threat evaluation includes:
  - ODOT/County Accident & Hwy Information
  - Spill History in watershed
  - Inventory of industrial & commercial facilities
  - Forest Mngt chemical use/storage/transport
  - Lane County commodity transport study

Type of Threat	Most Probable Chemicals
Truck Transport	Petroleum Products
	Fertilizers
	Pesticides
Helicopter Transport	Fertilizers
	Pesticides
Accidents/HazMat Spills	Petroleum Products
Fixed Facilities Near River	Petroleum Products
	Fertilizers
	Sodium Hydroxide

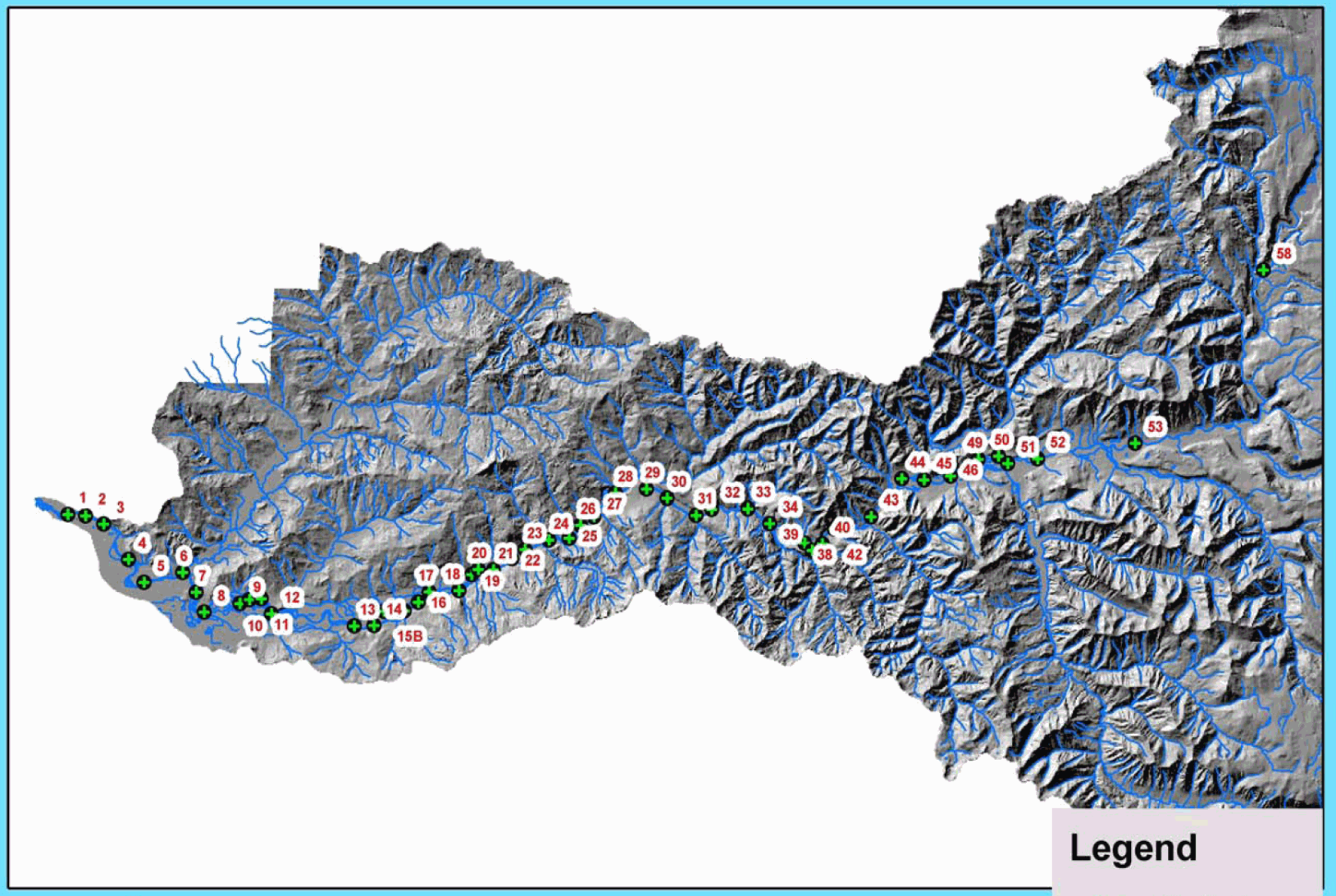
MWERS Provides Responders With:

- Response Information and Data In GIS: compiled and updated from partner agencies, and readily available and easily accessible for first responders ($65,000 in grants)

- Response Equipment and Resources: inventoried from 27 federal, state, and local agencies ($420,000 in grants for 3 response trailers, laptops, handhelds, mobile color printers, GIS software, GPS units)

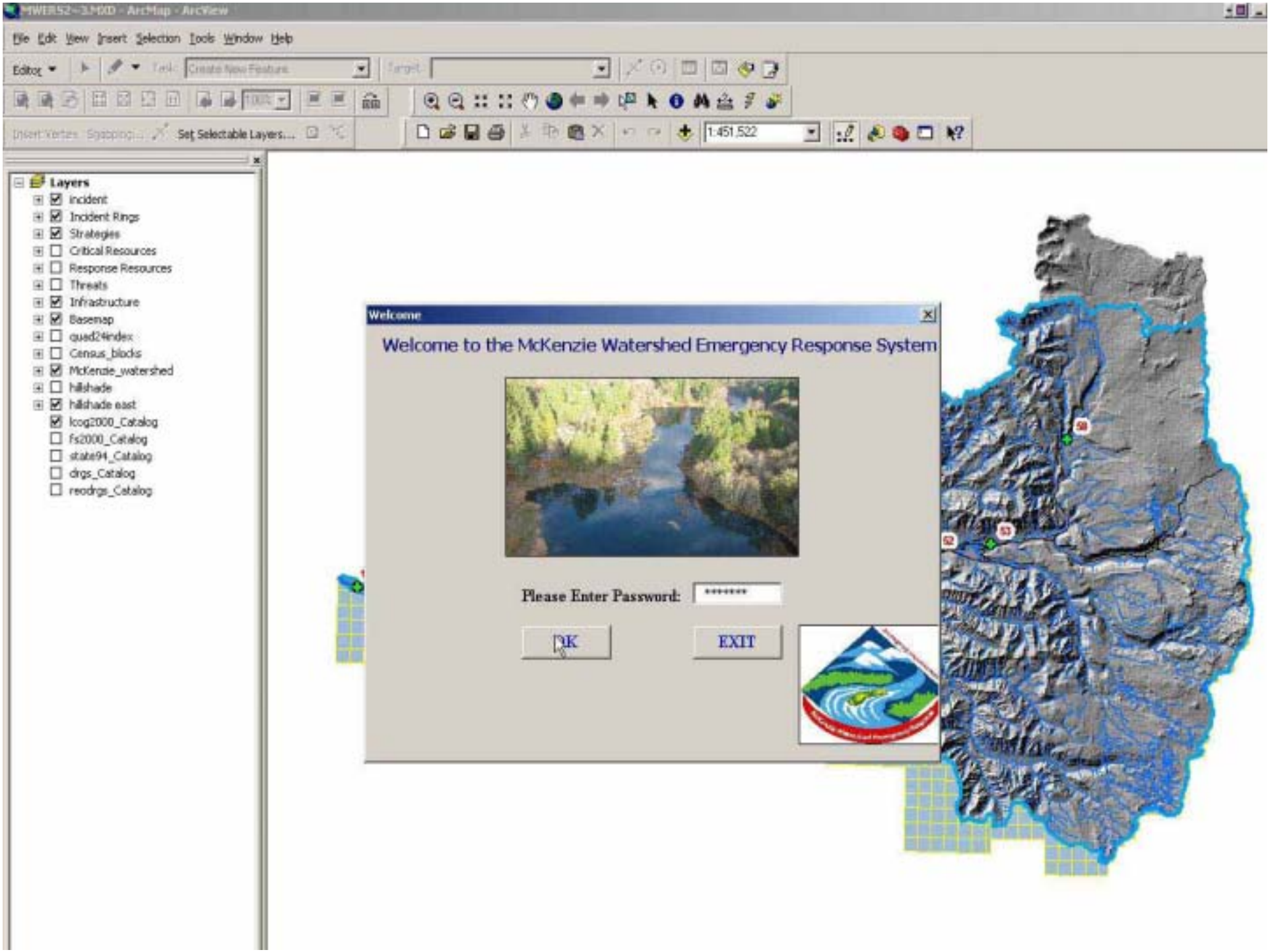
- Interagency Training/Drills: conducted 8 trainings involving 208 people from 33 agencies/organizatons ($97,000 in grants)

Location of Response Strategies, McKenzie Watershed



Our Approach

- Provide first responders with the tools they need to avoid confusion and implement response actions to stabilize an incident within the initial hours of a spill or chemical release.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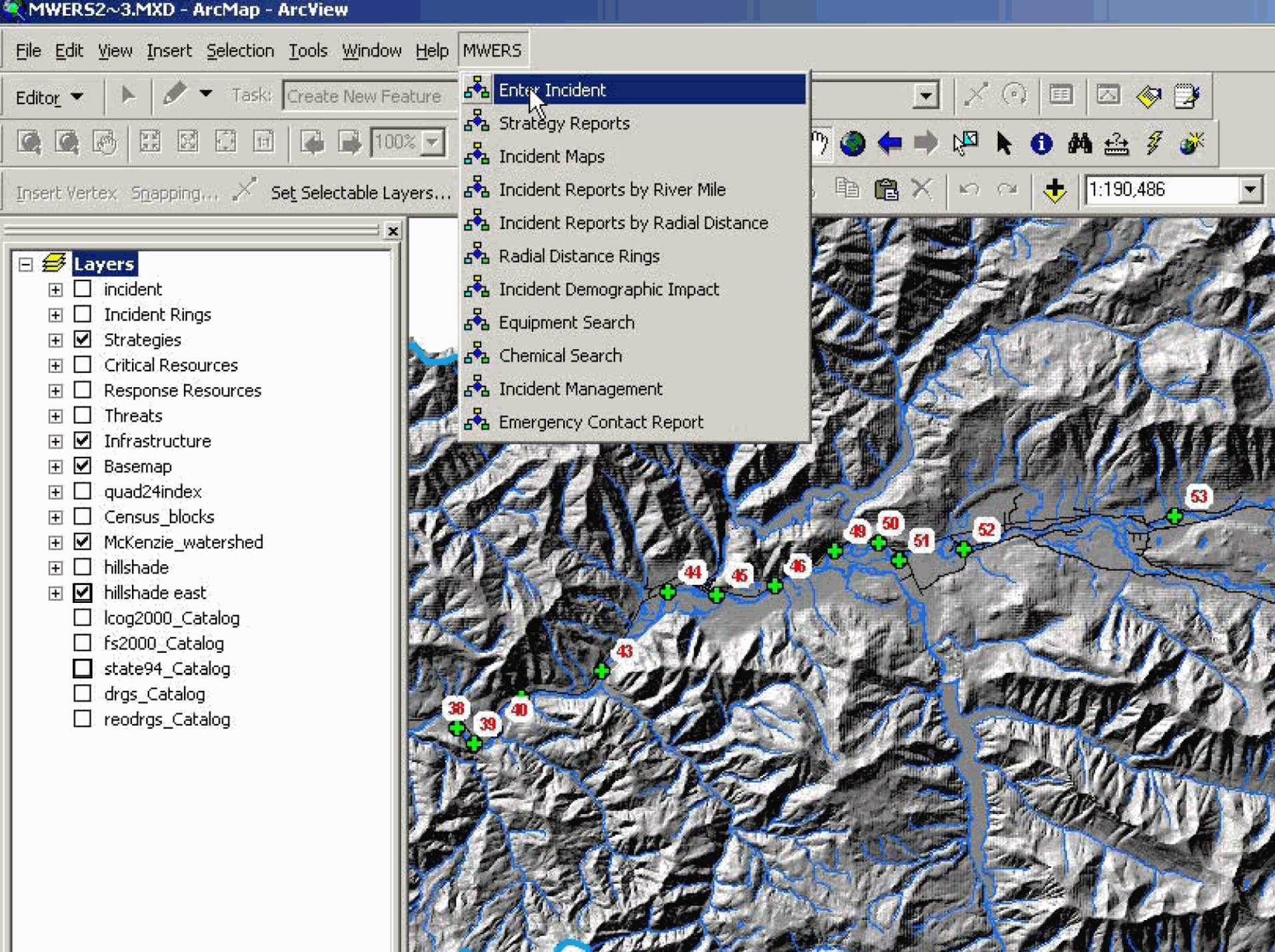
Layers
Incident
Incident Rings
Strategies
Critical Resources
Response Resources
Threats
Infrastructure
Basemap
quad24index
Census_blocks
McKenzie_watershed
hillshade
hillshade east
lcog2000_Catalog
fs2000_Catalog
state94_Catalog
drgs_Catalog
reodrgs_Catalog
Welcome
Welcome to the McKenzie Watershed Emergency Response System
Please Enter Password:
****
OK
EXIT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Incident Maps
Incident Reports by River Mile
Incident Reports by Radial Distance
Radial Distance Rings
Incident Demographic Impact
Equipment Search
Chemical Search
Incident Management
Emergency Contact Report
Layers
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Incident Rings
Strategies
Critical Resources
Response Resources
Threats
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fs2000_Catalog
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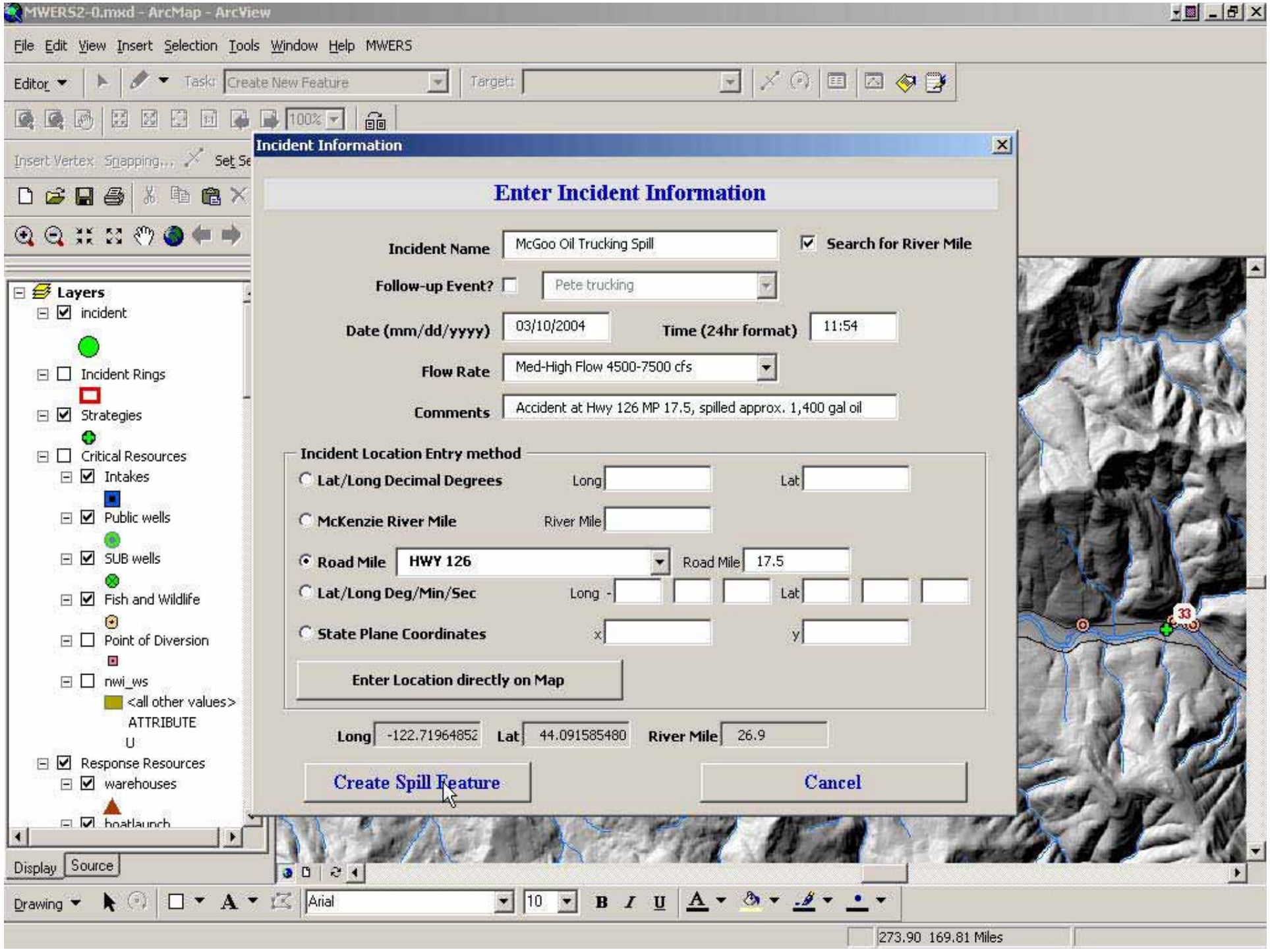
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Task: Create New Feature
Target:
Incident Information
Enter Incident Information
Incident Name
McGoo Oil Trucking Spill
Search for River Mile
Follow-up Event?
Pete trucking
Date (mm/dd/yyyy)
03/10/2004
Time (24hr format)
11:54
Flow Rate
Med-High Flow 4500-7500 cfs
Comments
Accident at Hwy 126 MP 17.5, spilled approx. 1,400 gal oil
Incident Location Entry method
Lat/Long Decimal Degrees
Long
Lat
McKenzie River Mile
River Mile
Road Mile
HWY 126
Road Mile
17.5
Lat/Long Deg/Min/Sec
Long -
Lat
State Plane Coordinates
x
y
Enter Location directly on Map
Long
-122.71964852
Lat
44.091585480
River Mile
26.9
Create Spill Feature
Cancel
Layers
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Incident Rings
Strategies
Critical Resources
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Public wells
SUB wells
Fish and Wildlife
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Response Resources
warehouses
boatlaunch
Display
Source
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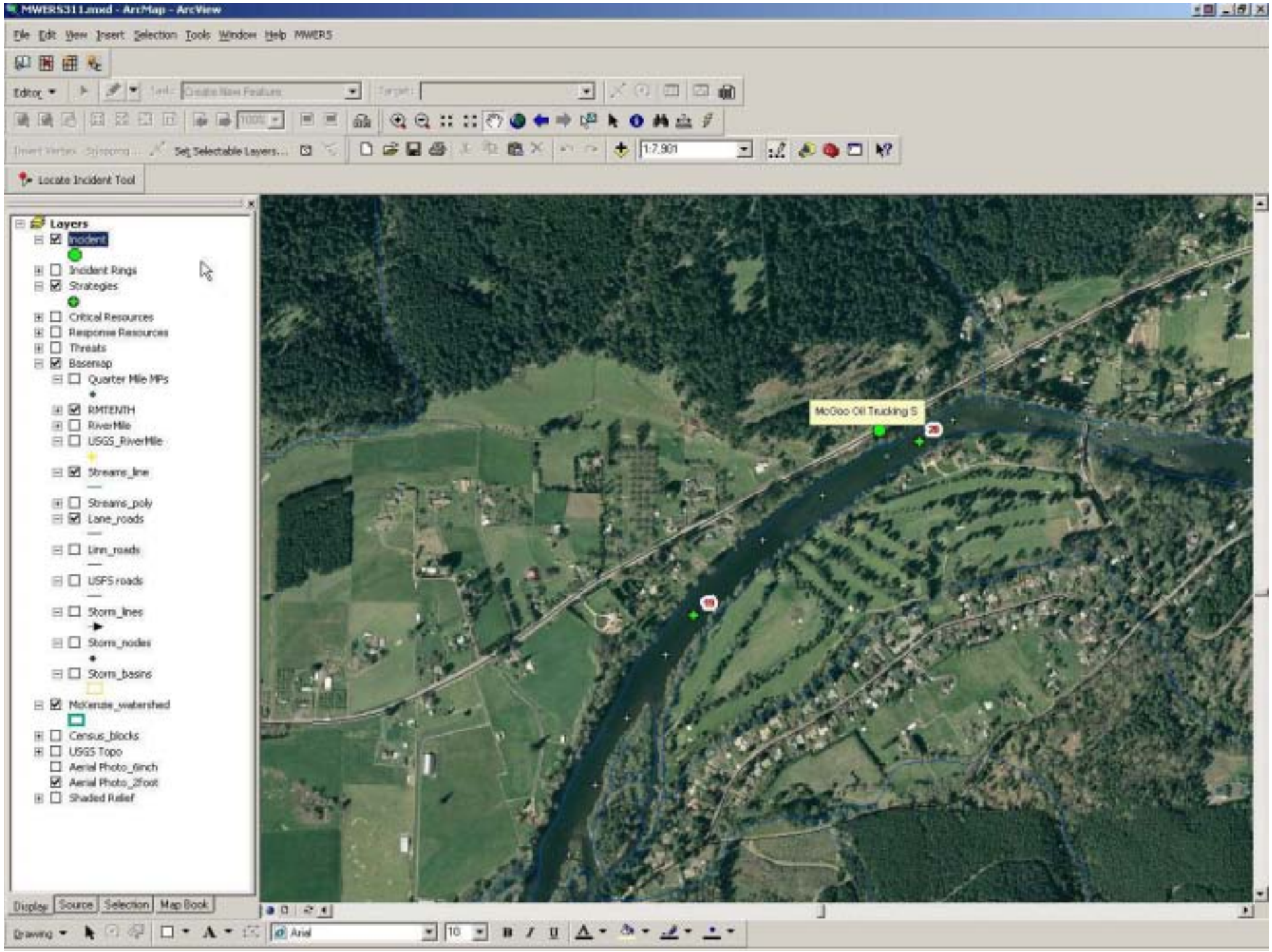
Arial
10
273.90 169.81 Miles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Layers
Incident
Incident Rings
Strategies
Critical Resources
Response Resources
Threats
Basemap
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RiverMile
USGS_RiverMile
Streams_line
Streams_poly
Lane_roads
Linn_roads
USFS roads
Storm_lines
Storm_nodes
Storm_basins
McKenzie_watershed
Census_blocks
USGS Topo
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Aerial Photo_2foot
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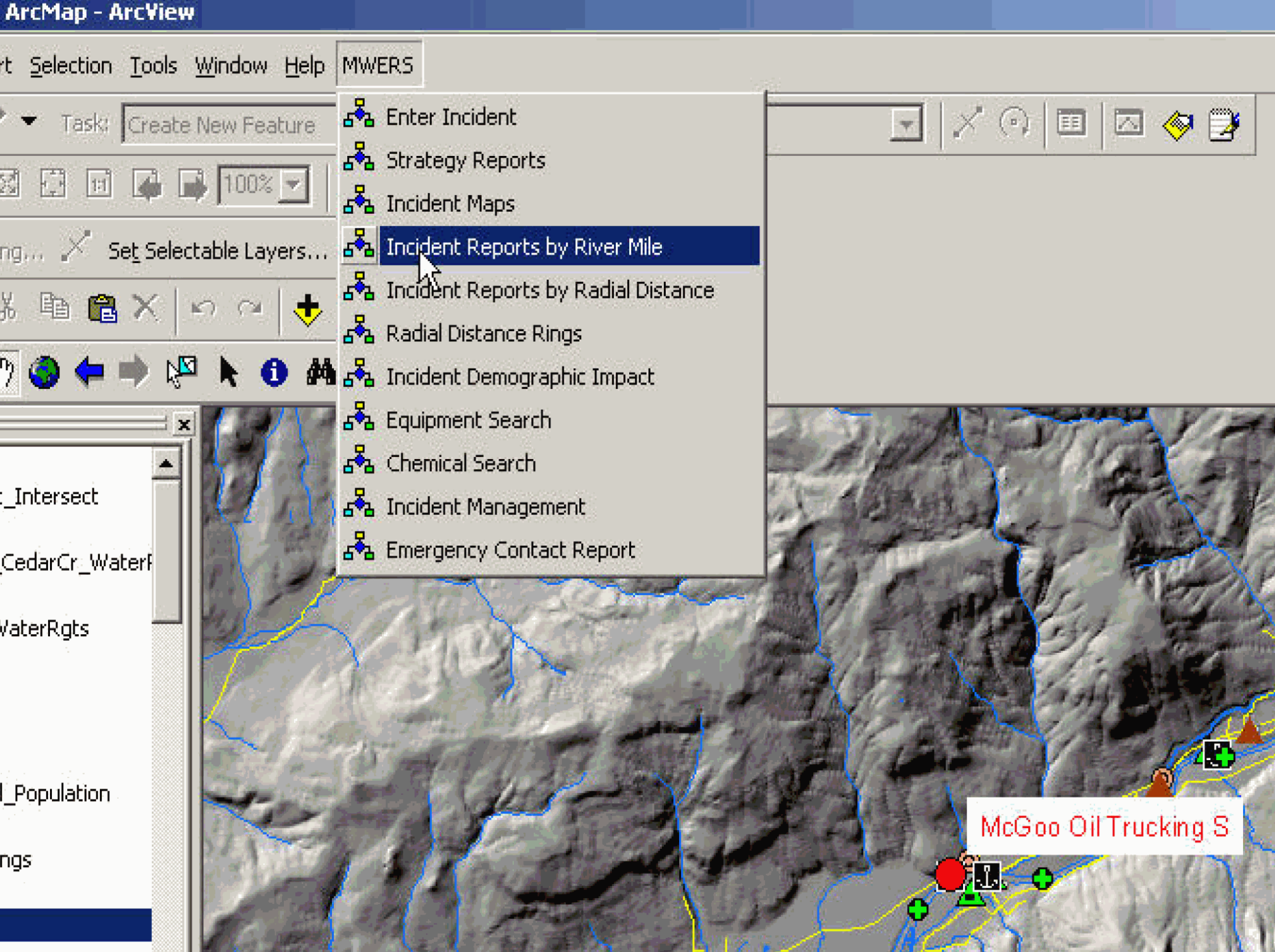
Display
Source
Selection
Map Book
Drawing
Arial
10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Incident Reports by River Mile
Incident Reports by Radial Distance
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Equipment Search
Chemical Search
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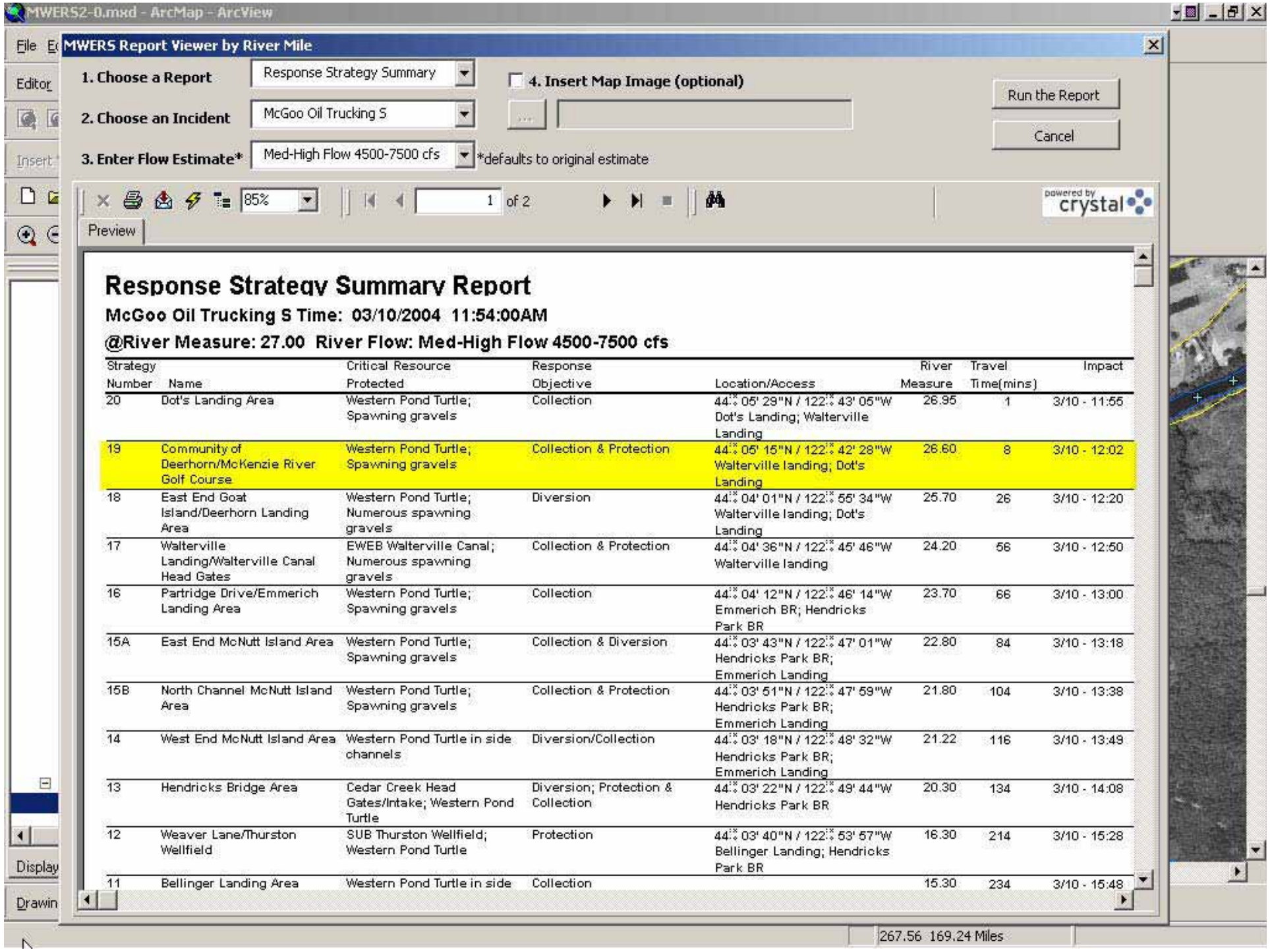
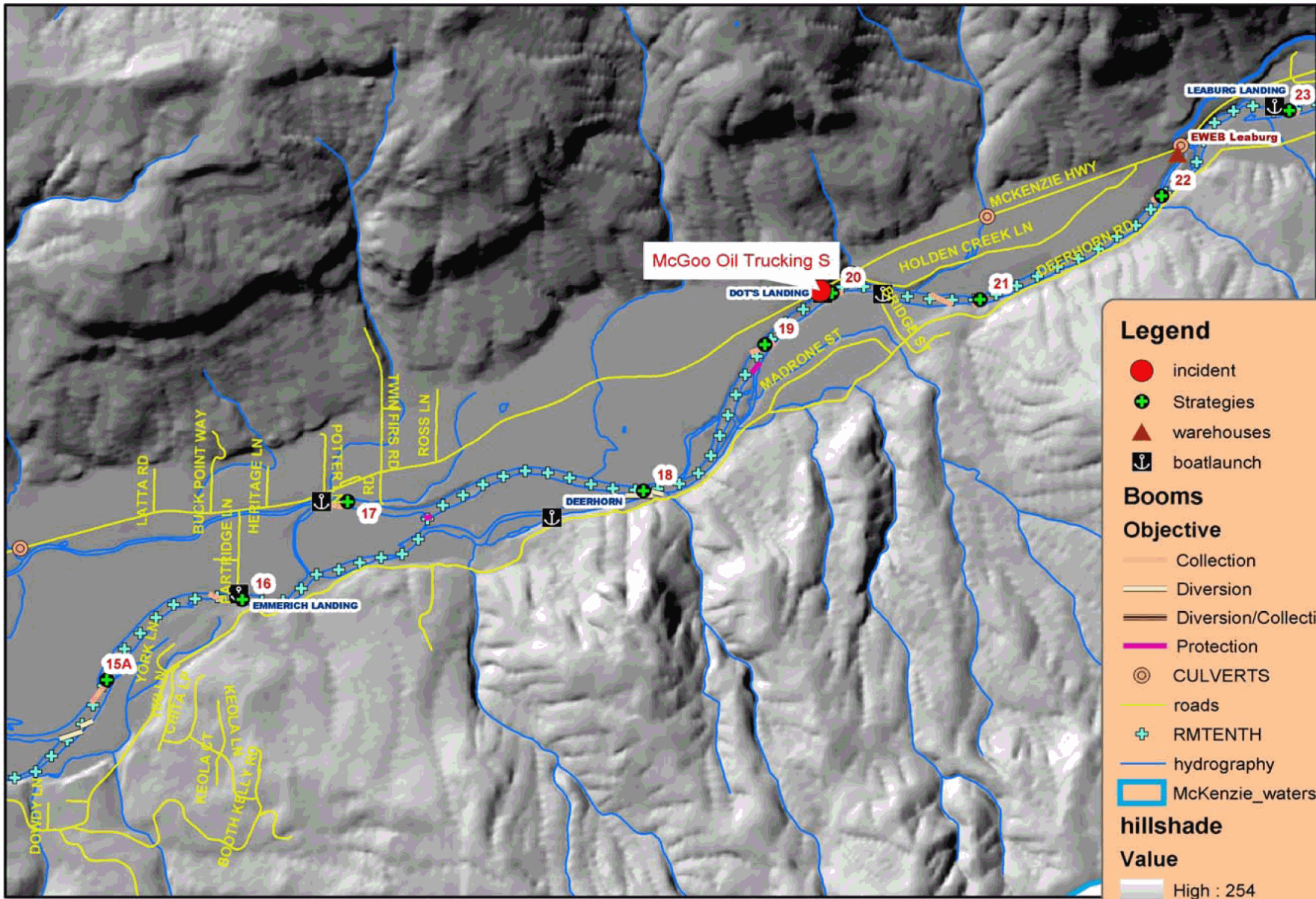
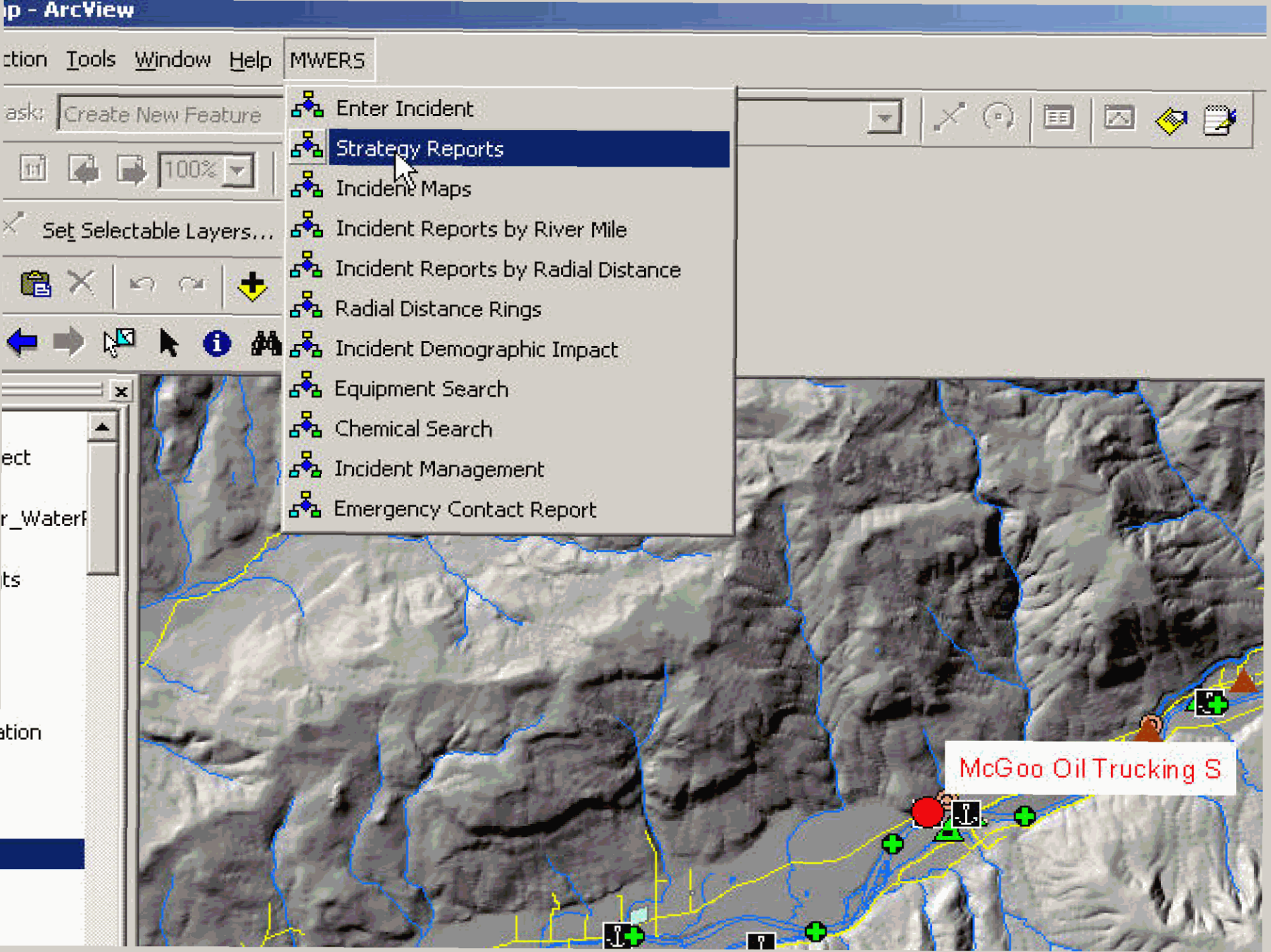
McGoo Oil Trucking S


MWERS2-0.mxd - ArcMap - ArcView
MWERS Report Viewer by River Mile
1. Choose a Report
Response Strategy Summary
4. Insert Map Image (optional)
2. Choose an Incident
McGoo Oil Trucking S
3. Enter Flow Estimate*
Med-High Flow 4500-7500 cfs
*defaults to original estimate
Run the Report
Cancel
85%
1 of 2
Preview
Response Strategy Summary Report
McGoo Oil Trucking S Time: 03/10/2004 11:54:00AM
@River Measure: 27.00 River Flow: Med-High Flow 4500-7500 cfs
Strategy Number
Name
Critical Resource Protected
Response Objective
Location/Access
River Measure
Travel Time(mins)
Impact
20
Dot's Landing Area
Western Pond Turtle; Spawning gravels
Collection
44° 05' 29"N / 122° 43' 05"W Dot's Landing; Walterville Landing
26.95
1
3/10 - 11:55
19
Community of Deerhorn/McKenzie River Golf Course
Western Pond Turtle; Spawning gravels
Collection & Protection
44° 05' 15"N / 122° 42' 28"W Walterville landing; Dot's Landing
26.60
8
3/10 - 12:02
18
East End Goat Island/Deerhorn Landing Area
Western Pond Turtle; Numerous spawning gravels
Diversion
44° 04' 01"N / 122° 55' 34"W Walterville landing; Dot's Landing
25.70
26
3/10 - 12:20
17
Walterville Landing/Walterville Canal Head Gates
EWEB Walterville Canal; Numerous spawning gravels
Collection & Protection
44° 04' 36"N / 122° 45' 46"W Walterville landing
24.20
56
3/10 - 12:50
16
Partridge Drive/Emmerich Landing Area
Western Pond Turtle; Spawning gravels
Collection
44° 04' 12"N / 122° 46' 14"W Emmerich BR; Hendricks Park BR
23.70
66
3/10 - 13:00
15A
East End McNutt Island Area
Western Pond Turtle; Spawning gravels
Collection & Diversion
44° 03' 43"N / 122° 47' 01"W Hendricks Park BR; Emmerich Landing
22.80
84
3/10 - 13:18
15B
North Channel McNutt Island Area
Western Pond Turtle; Spawning gravels
Collection & Protection
44° 03' 51"N / 122° 47' 59"W Hendricks Park BR; Emmerich Landing
21.80
104
3/10 - 13:38
14
West End McNutt Island Area
Western Pond Turtle in side channels
Diversion/Collection
44° 03' 18"N / 122° 48' 32"W Hendricks Park BR; Emmerich Landing
21.22
116
3/10 - 13:49
13
Hendricks Bridge Area
Cedar Creek Head Gates/Intake; Western Pond Turtle
Diversion; Protection & Collection
44° 03' 22"N / 122° 49' 44"W Hendricks Park BR
20.30
134
3/10 - 14:08
12
Weaver Lane/Thurston Wellfield
SUB Thurston Wellfield; Western Pond Turtle
Protection
44° 03' 40"N / 122° 53' 57"W Bellinger Landing; Hendricks Park BR
16.30
214
3/10 - 15:28
11
Bellinger Landing Area
Western Pond Turtle in side
Collection
15.30
234
3/10 - 15:48
267.56 169.24 Miles

McGoo Spill Response Resources Map

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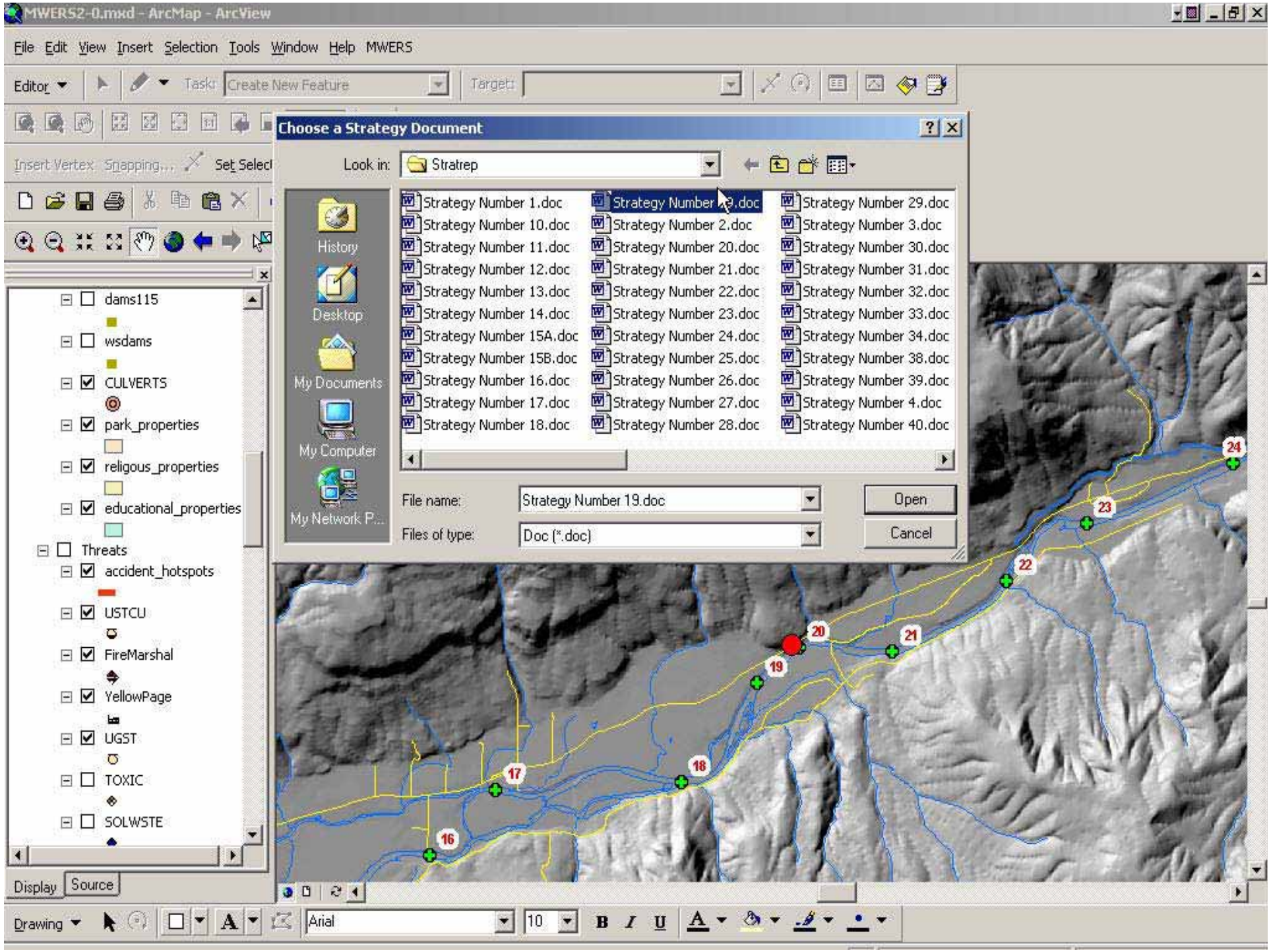
Equipment Search
Chemical Search
Incident Management
Emergency Contact Report
McGoo Oil Trucking S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Target:
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Look in: Stratrep
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Strategy Number 1.doc
Strategy Number 10.doc
Strategy Number 11.doc
Strategy Number 12.doc
Strategy Number 13.doc
Strategy Number 14.doc
Strategy Number 15A.doc
Strategy Number 15B.doc
Strategy Number 16.doc
Strategy Number 17.doc
Strategy Number 18.doc
Strategy Number 19.doc
Strategy Number 2.doc
Strategy Number 20.doc
Strategy Number 21.doc
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Strategy Number 27.doc
Strategy Number 28.doc
Strategy Number 29.doc
Strategy Number 3.doc
Strategy Number 30.doc
Strategy Number 31.doc
Strategy Number 32.doc
Strategy Number 33.doc
Strategy Number 34.doc
Strategy Number 38.doc
Strategy Number 39.doc
Strategy Number 4.doc
Strategy Number 40.doc
File name: Strategy Number 19.doc
Files of type: Doc (*.doc)
Open
Cancel
dams115
wsdams
CULVERTS
park_properties
religous_properties
educational_properties
Threats
accident_hotspots
USTCU
FireMarshal
YellowPage
UGST
TOXIC
SOLWSTE
Display
Source
Drawing
Arial
10
16
17
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24

Strategy Number 19

Community of Deerhorn/McKenzie River Golf Course Area

Response Objectives:

- Collection
- Protection

Critical Resources to be Protected:

- Western pond turtle habitat in side channels along the south channel.
- Spawning area west of boom placement area.

Location:

- Community of Deerhorn/McKenzie River Golf Course area is located 2.4 miles west of Leaburg. McKenzie River Golf Course is along south bank of boom placement area and can be accessed by taking Holden Creek Lane off (south) of McKenzie Highway at mile post 17.6, cross bridge and golf course is to the west.
- North bank of boom placement area is approximately 550 feet south of McKenzie Highway milepost 17 behind residences.
- 44° 05' 15"N / 122° 43' 28"W

Description of Response Tactics:

- Deploy 400 feet of 4x6 solid containment boom from south bank across side channel and anchor west end of boom on island to protect critical habitat in side channel.
- Deploy 700 feet of 4x6 solid containment boom at an angle of 22-30 degrees SE from the spilled product collection and recovery area (north bank behind residence).
- At product collection and recovery area protect shoreline with additional solid containment boom, sorbent boom/pads and poly sheeting. Collect product with oil recovery skimmer and pump into waste pools or other temporary storage units.

Access Areas:

- Closest down river access is Walterville Landing boat ramp (north bank of north channel around Goat island) at 2.3 miles west of the boom placement area via boat (or 2.1 miles by vehicle).
- Deerhorn boat ramp is also located down river along the south bank of the south channel around Goat Island approximately 1.3 miles via boat and 1.5 miles by vehicle off of Deerhorn Road.
- Closest up river access point is Dot's Landing boat ramp (north bank of river) 0.6 miles east on McKenzie Highway or 0.4 miles by boat at USGS river mile 31.3 or measured river mile 26.9.
- Access to north bank area is accessible at various areas behind residences. South bank is readily accessible from the golf course.

Staging Areas:

- Walterville Landing has some space for staging equipment and is a newly improved boat ramp.
- EWEB's Leaburg powerhouse complex (2.3 miles east on McKenzie Highway) is a potential equipment staging area that has open space to stage equipment, a nearby park for further staging, cabins for office space, water, electricity, and restrooms.
- Deerhorn Park is another close staging area with ample space, boat launch, and restrooms.
- Nearest equipment warehouse is EWEB's Leaburg Powerhouse (2.3 miles east on McKenzie Highway).

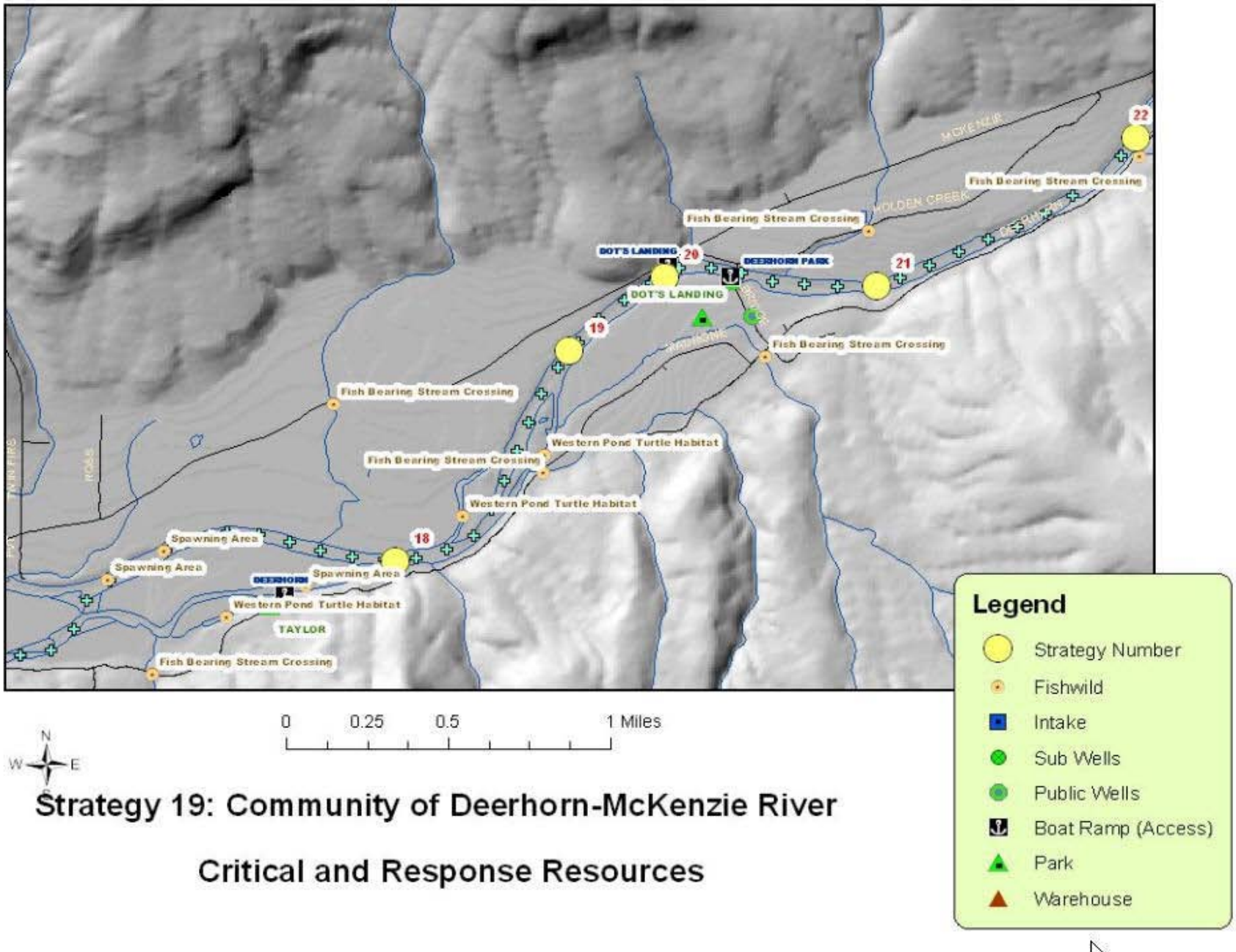
Watercourse Description:

- 1.5 m/s flow during high flow
- River width = 275-350 feet

Equipment Needs:

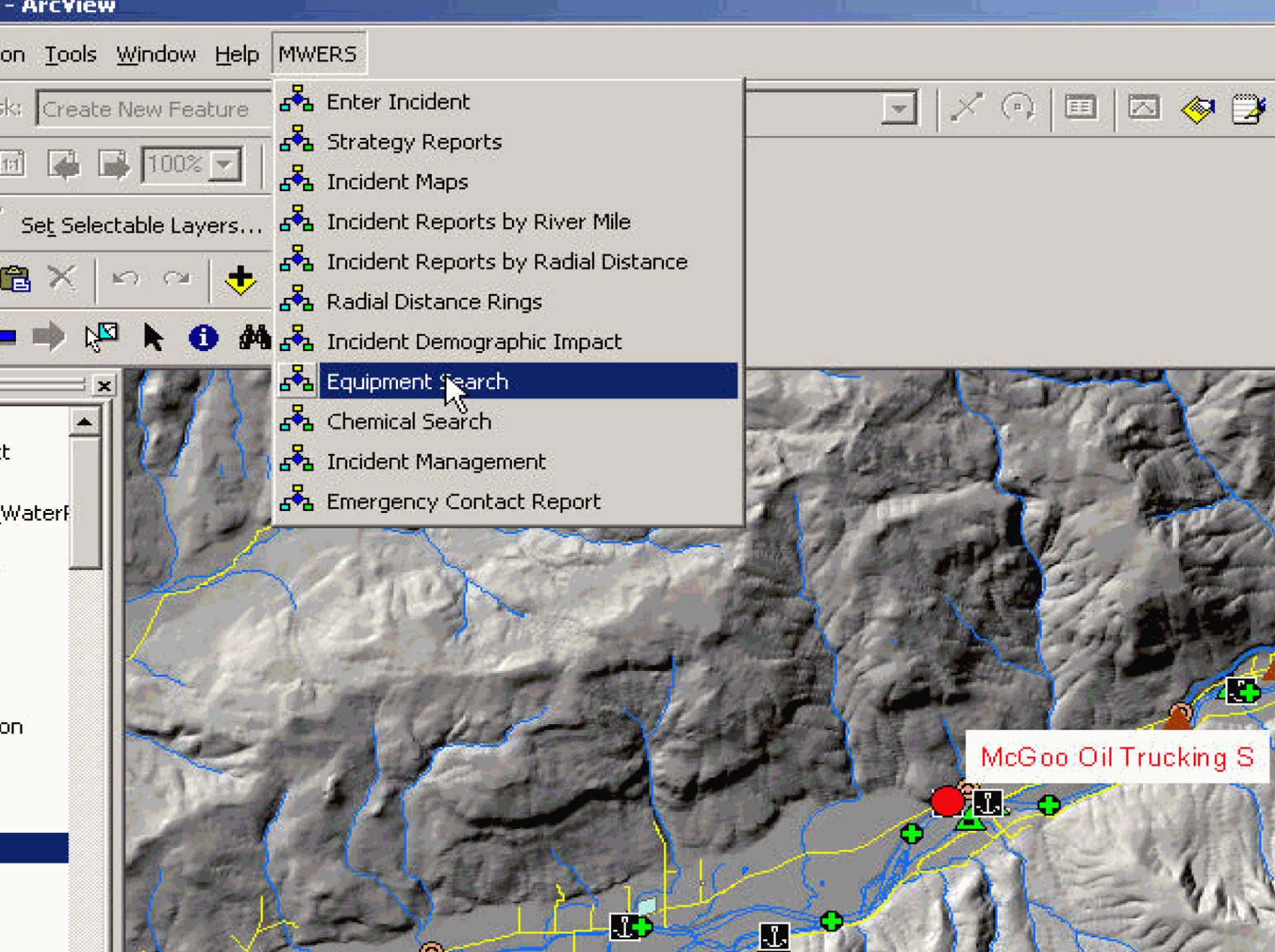
1,100 feet solid containment boom (w/8-9 tow bridles)
Boom Deployment Equipment and 7 buoys
Multiple Fence Posts w/hammer (used to anchor A, B, & C lines for boom deployment)
300 feet sorbent boom (shoreline protection)
300 feet solid containment boom (shoreline protection)
200 feet x 50 feet of Poly sheeting (shoreline protection & decon area)
12 bales sorbent pads
Compressor
Chemical Pump
Generator
1 Jet boat
Decon equipment
Pressure washer w/pump
3-4 Decon waste pools within containment berm
Oil Recovery Drum Skimmer (product recovery)
11,000 feet of Rope (3/8" poly rope)

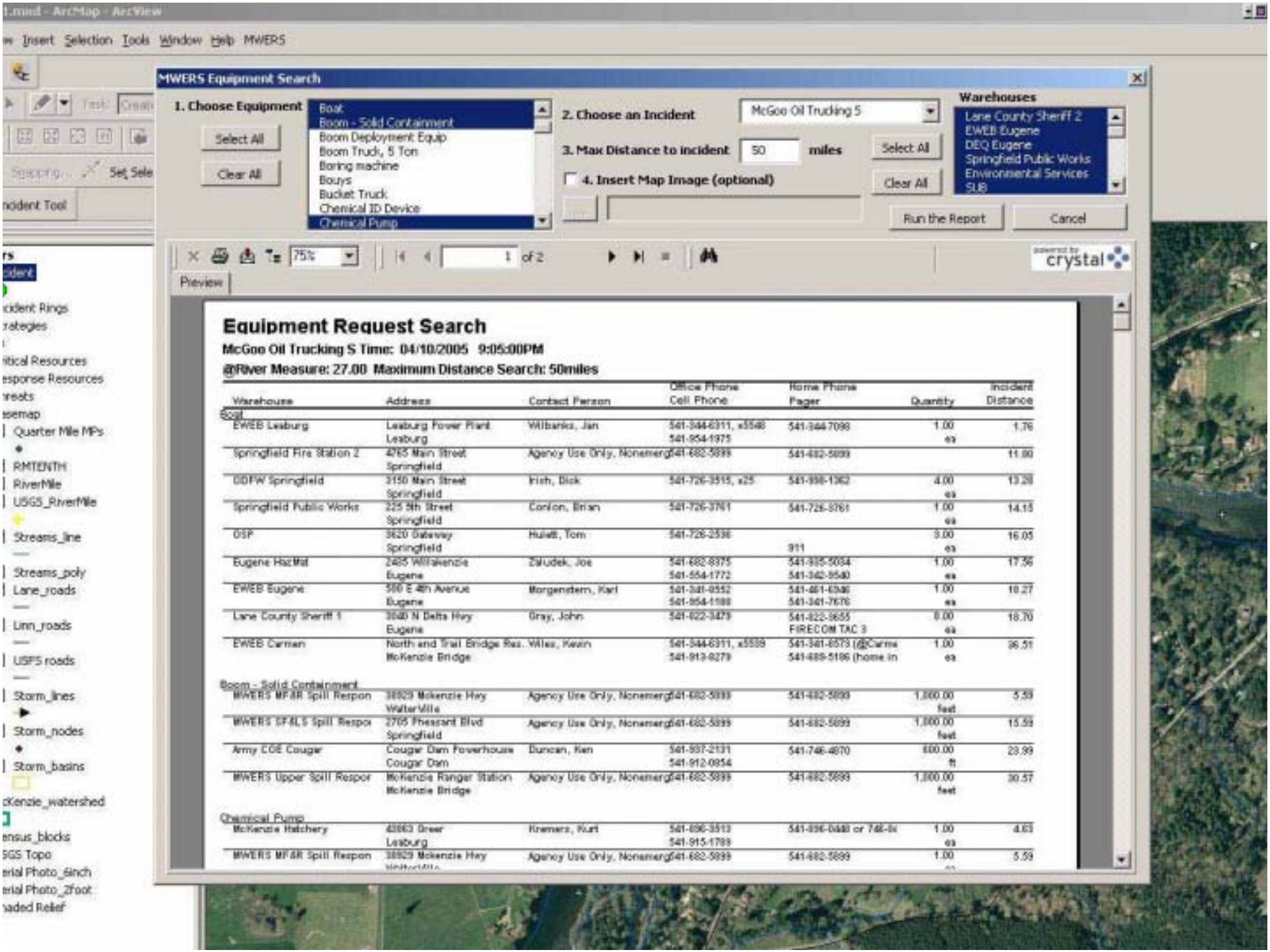
Strategy 19: Community of Deerhorn-McKenzie River

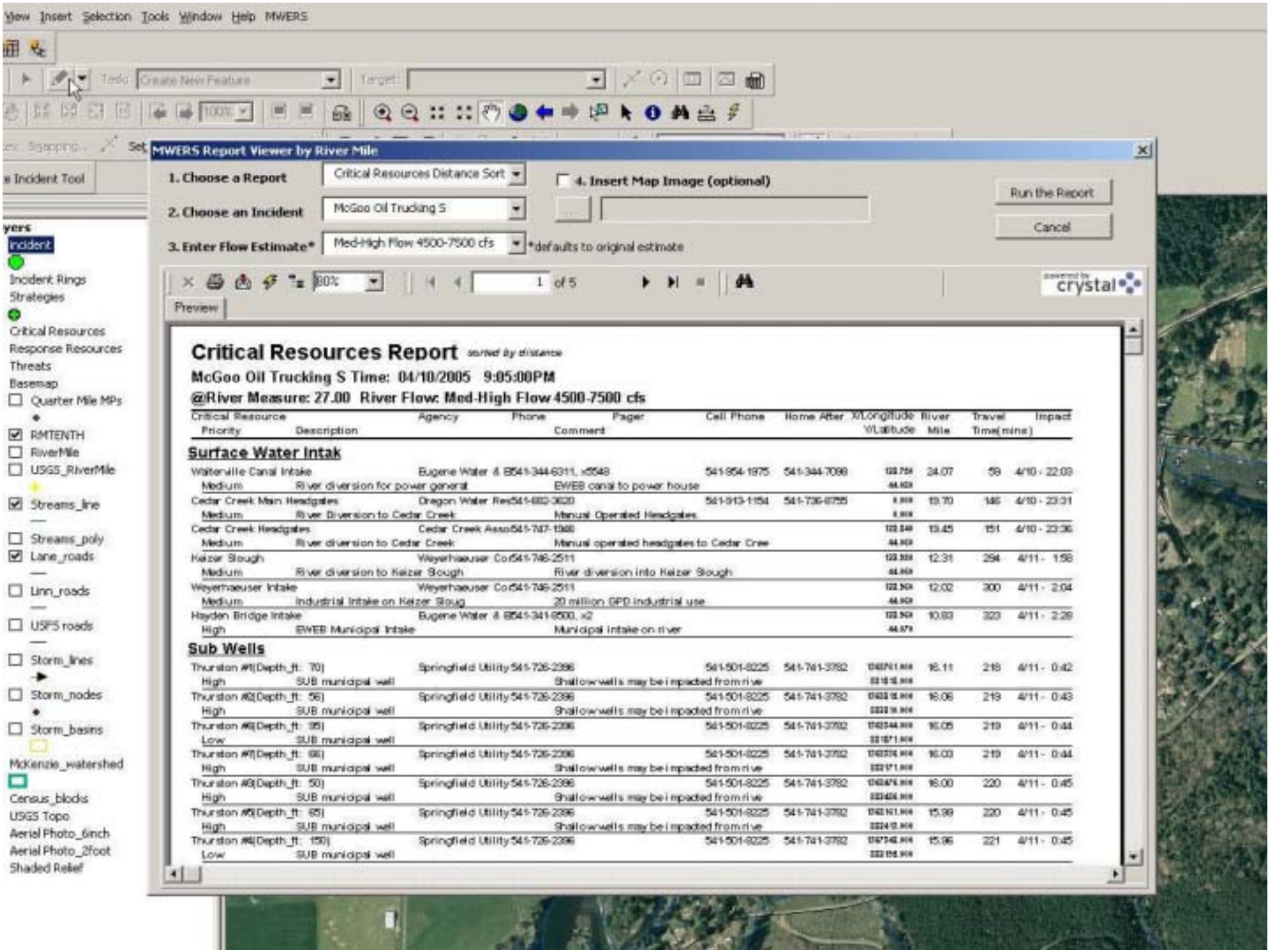


Strategy 19: Community of Deerhorn-McKenzie River

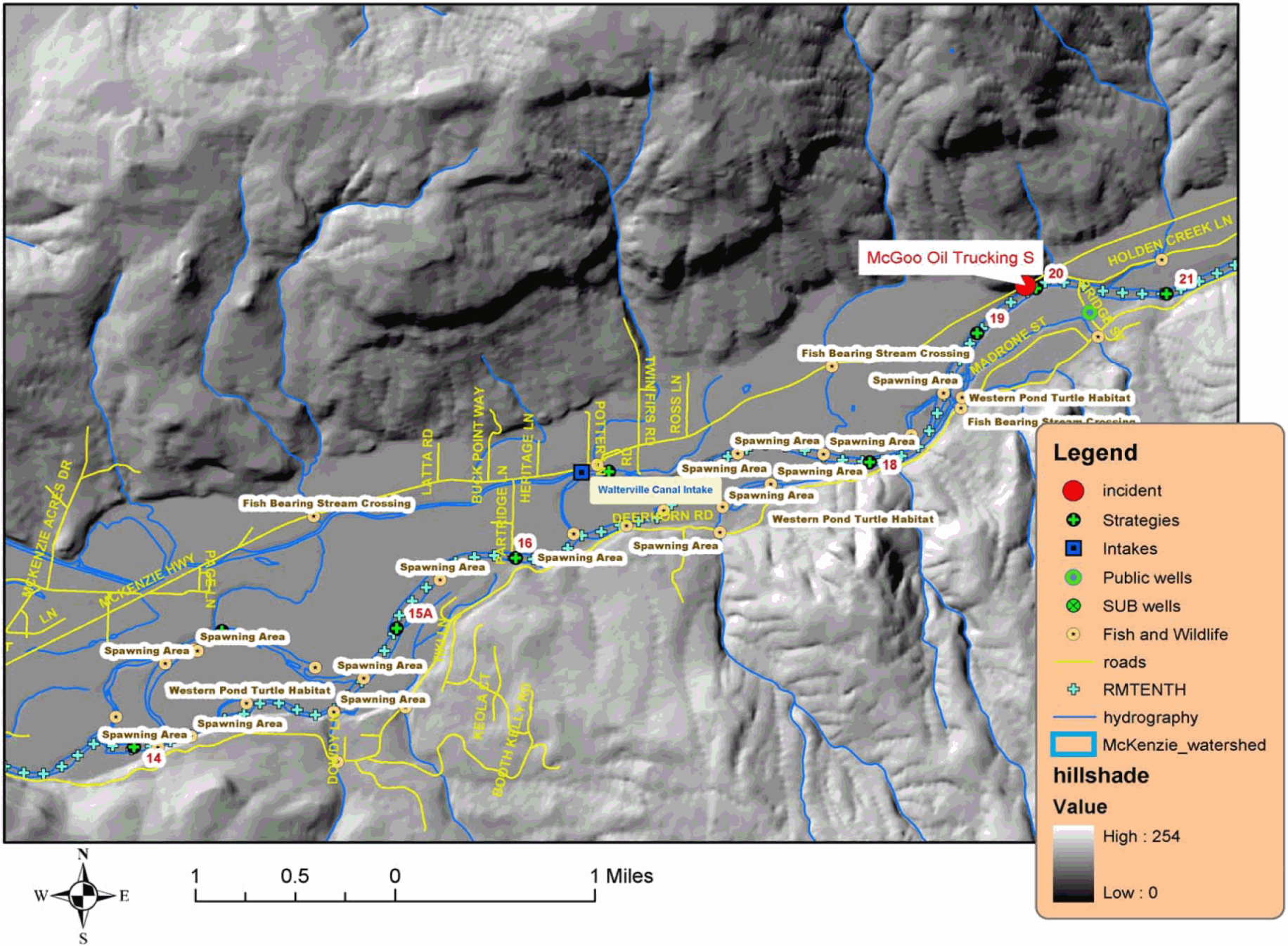
Critical and Response Resources


- ArcView
on Tools Window Help MWERS
Create New Feature
100%
Set Selectable Layers...
Enter Incident
Strategy Reports
Incident Maps
Incident Reports by River Mile
Incident Reports by Radial Distance
Radial Distance Rings
Incident Demographic Impact
Equipment Search
Chemical Search
Incident Management
Emergency Contact Report
McGoo Oil Trucking S


MWERS Equipment Search
1. Choose Equipment
Boat
Boom - Solid Containment
Boom Deployment Equip
Boom Truck, 5 Ton
Boring machine
Bouys
Bucket Truck
Chemical ID Device
Chemical Pump
Select All
Clear All
2. Choose an Incident
McGoo Oil Trucking 5
3. Max Distance to incident
50
miles
4. Insert Map Image (optional)
Warehouses
Lane County Sheriff 2
EWEB Eugene
DEQ Eugene
Springfield Public Works
Environmental Services
SUB
Run the Report
Cancel
Preview
Equipment Request Search
McGoo Oil Trucking S Time: 04/10/2005 9:05:00PM
@River Measure: 27.00 Maximum Distance Search: 50miles
Warehouse
Address
Contact Person
Office Phone
Cell Phone
Home Phone
Pager
Quantity
Incident Distance
Boat
EWEB Lesburg
Lesburg Power Plant
Lesburg
Wilbanks, Jan
541-344-6311, x5548
541-954-1975
541-344-7098
1.00
ea
1.76
Springfield Fire Station 2
4765 Main Street
Springfield
Agency Use Only, Nonemerg
541-682-5899
541-682-5899
11.80
ODFW Springfield
3150 Main Street
Springfield
Irish, Dick
541-726-3515, x25
541-998-1362
4.00
ea
13.28
Springfield Public Works
225 5th Street
Springfield
Conlon, Brian
541-726-3761
541-726-3761
1.00
ea
14.15
OSP
3620 Gateway
Springfield
Hulett, Tom
541-726-2536
911
3.00
ea
16.05
Eugene HazMat
2465 Willakenzie
Eugene
Zaludek, Joe
541-682-8375
541-554-1772
541-935-5034
541-342-9540
1.00
ea
17.56
EWEB Eugene
500 E 4th Avenue
Eugene
Morgenstern, Karl
541-341-8552
541-954-1188
541-461-6346
541-341-7676
1.00
ea
18.27
Lane County Sheriff 1
3040 N Delta Hwy
Eugene
Gray, John
541-922-3479
541-922-9655
FIRECOM TAC 3
0.00
ea
18.70
EWEB Carmen
North end Trail Bridge Res.
McKenzie Bridge
Wiles, Kevin
541-344-6311, x5539
541-913-8279
541-341-8573 (@Carme
541-689-5186 (home in
1.00
ea
36.51
Boom - Solid Containment
MWERS MF&R Spill Respon
38929 Mckenzie Hwy
WalterVille
Agency Use Only, Nonemerg
541-682-5899
541-682-5899
1,000.00
feet
5.59
MWERS SF&LS Spill Respor
2705 Pheasant Blvd
Springfield
Agency Use Only, Nonemerg
541-682-5899
541-682-5899
1,000.00
feet
15.59
Army COE Cougar
Cougar Dam Powerhouse
Cougar Dam
Duncan, Ken
541-937-2131
541-912-0854
541-746-4870
600.00
ft
23.99
MWERS Upper Spill Respor
McKenzie Ranger Station
McKenzie Bridge
Agency Use Only, Nonemerg
541-682-5899
541-682-5899
1,000.00
feet
30.57
Chemical Pump
McKenzie Hatchery
42863 Greer
Lesburg
Kremers, Kurt
541-896-3513
541-915-1789
541-896-0448 or 746-8
1.00
ea
4.63
MWERS MF&R Spill Respon
38929 Mckenzie Hwy
Agency Use Only, Nonemerg
541-682-5899
541-682-5899
1.00
5.59


View Insert Selection Tools Window Help MWERS
Create New Feature
Incident Tool
Incident
Incident Rings
Strategies
Critical Resources
Response Resources
Threats
Basemap
Quarter Mile MPs
RMTENTH
RiverMile
USGS_RiverMile
Streams_line
Streams_poly
Lane_roads
Linn_roads
USFS roads
Storm_lines
Storm_nodes
Storm_basins
McKenzie_watershed
Census_blocks
USGS Topo
Aerial Photo_6inch
Aerial Photo_2foot
Shaded Relief
MWERS Report Viewer by River Mile
1. Choose a Report
Critical Resources Distance Sort
4. Insert Map Image (optional)
2. Choose an Incident
McGoo Oil Trucking S
Run the Report
Cancel
3. Enter Flow Estimate*
Med-High Flow 4500-7500 cfs
*defaults to original estimate
1 of 5
Preview
Critical Resources Report sorted by distance
McGoo Oil Trucking S Time: 04/10/2005 9:05:00PM
@River Measure: 27.00 River Flow: Med-High Flow 4500-7500 cfs
Surface Water Intak
Sub Wells

McGoo Spill Critical Resources Map




McKenzie Watershed Response Team
McKenzie Watershed Emergency Response

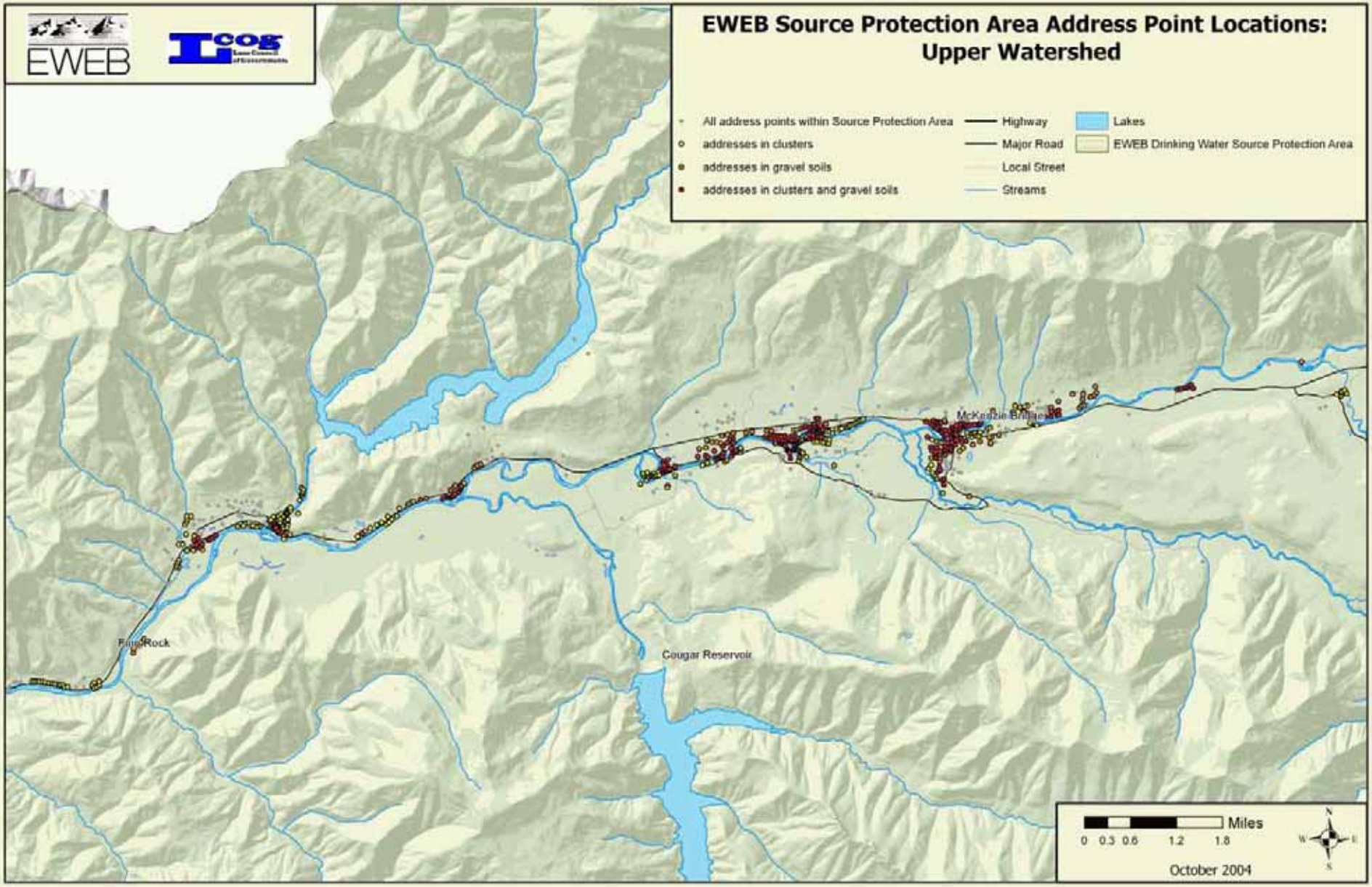
USFS & BLM Involvement

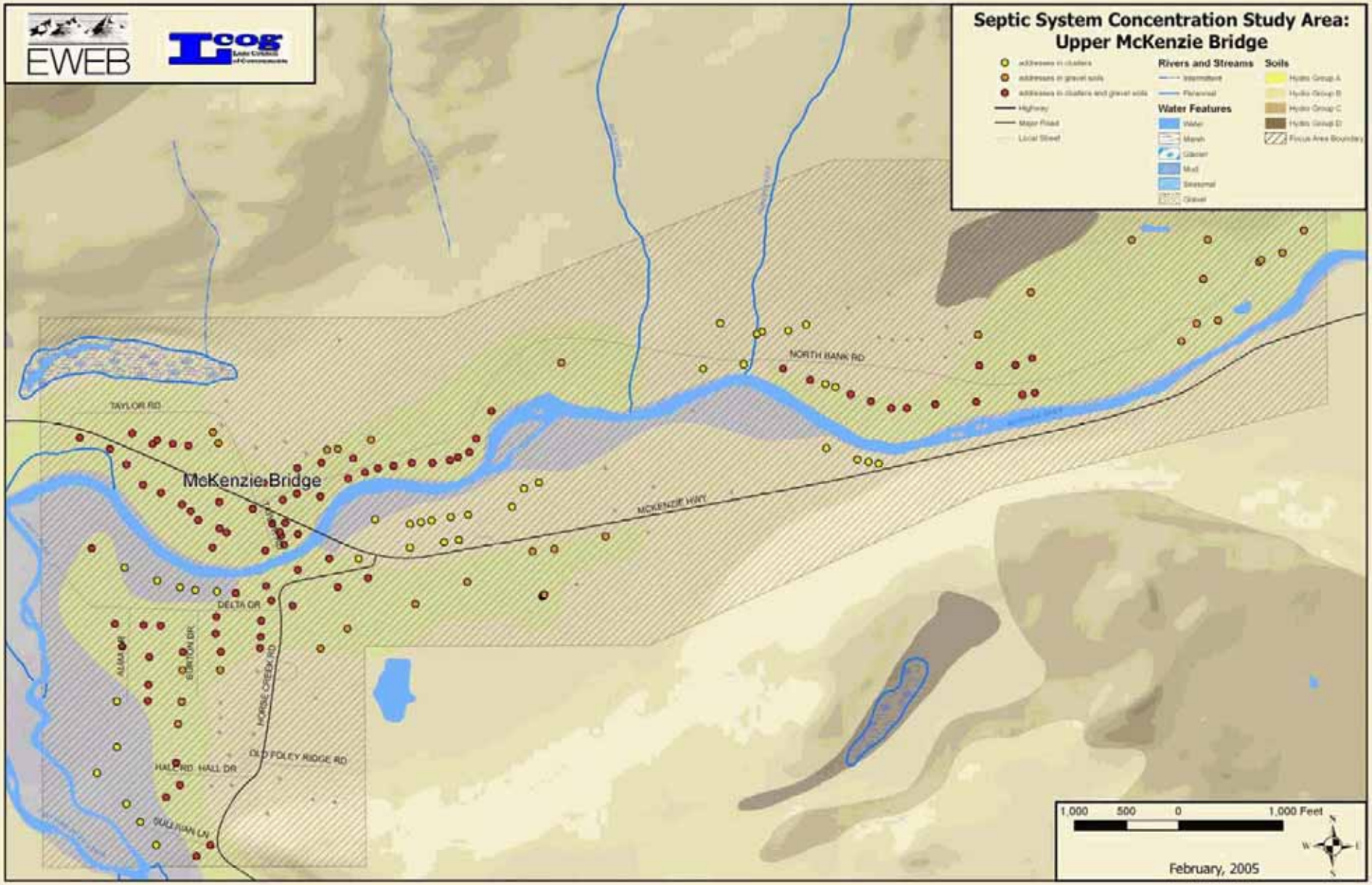
- Provide response equipment.
- House one of the three up river response trailers.
- Actively participate in all meetings, trainings, and drills.
- Contribute GIS and other valuable data to the system.
- Excellent to work with!

Septic Systems

McKenzie Watershed Septics

- Over 4,000 septic systems in the McKenzie Watershed upstream of EWEB's intake.
- No sewage treatment plants exist in the watershed (every house has a septic system).
- Focus on septics that are older, adjacent to waterways, in clusters, with gravelly soils.


EWEB
Lcog
EWEB Source Protection Area Address Point Locations:
Upper Watershed
All address points within Source Protection Area
addresses in clusters
addresses in gravel soils
addresses in clusters and gravel soils
Highway
Major Road
Local Street
Streams
Lakes
EWEB Drinking Water Source Protection Area
McKenzie Bridge
Cougar Reservoir
Miles
0 0.3 0.6 1.2 1.8
October 2004


EWEB
Lcog
Septic System Concentration Study Area:
Upper McKenzie Bridge
addresses in clusters
addresses in gravel soils
addresses in clusters and gravel soils
Highway
Major Road
Local Street
Rivers and Streams
Intermittent
Perennial
Water Features
Water
Marsh
Glacier
Mud
Seasonal
Gravel
Soils
Hydric Group A
Hydric Group B
Hydric Group C
Hydric Group D
Focus Area Boundary
NORTH BANK RD
TAYLOR RD
McKenzie Bridge
MCKENZIE HWY
DELTA DR
ALMA DR
EDISON DR
HORSE CREEK RD
OLD FOLEY RIDGE RD
HALFORD HALL DR
SULLIVAN LN
1,000 500 0 1,000 Feet
February, 2005

Septic Systems Approach

- Identified 5-6 focus areas and will talk to home owners in these areas this summer.
- Setup monitoring program during low flow months (August-September).
- Collect samples for fecal bacteria, detergent signatures, and nutrients.
- Look at setting up grant funded program to upgrade septic systems in these areas.

USFS Involvement

- The Good: Replaced all pit toilets in camp sites with concrete tanks that are pumped out & reduced dispersed camp sites.
- The Unfortunate: Most crew housing & other buildings have old septic systems.
- The Future: Participate in septic system program (Blue River & McKenzie Bridge).

Roadside Vegetation Management

- Working with Lane County and ODOT to get regular reports/data of:
  - When herbicide spraying occurs
  - Location and length of road sprayed
  - Type of herbicide and quantity used.
- Conduct storm runoff monitoring following spray event.
- Work with Lane County & ODOT to minimize potential impacts.

USFS & BLM

- Obtain data for spraying for invasive weeds.
- Look at coordination with EWEB, MWC, ODOT, ODFW, Lane County, ODA for invasive weeds eradication.

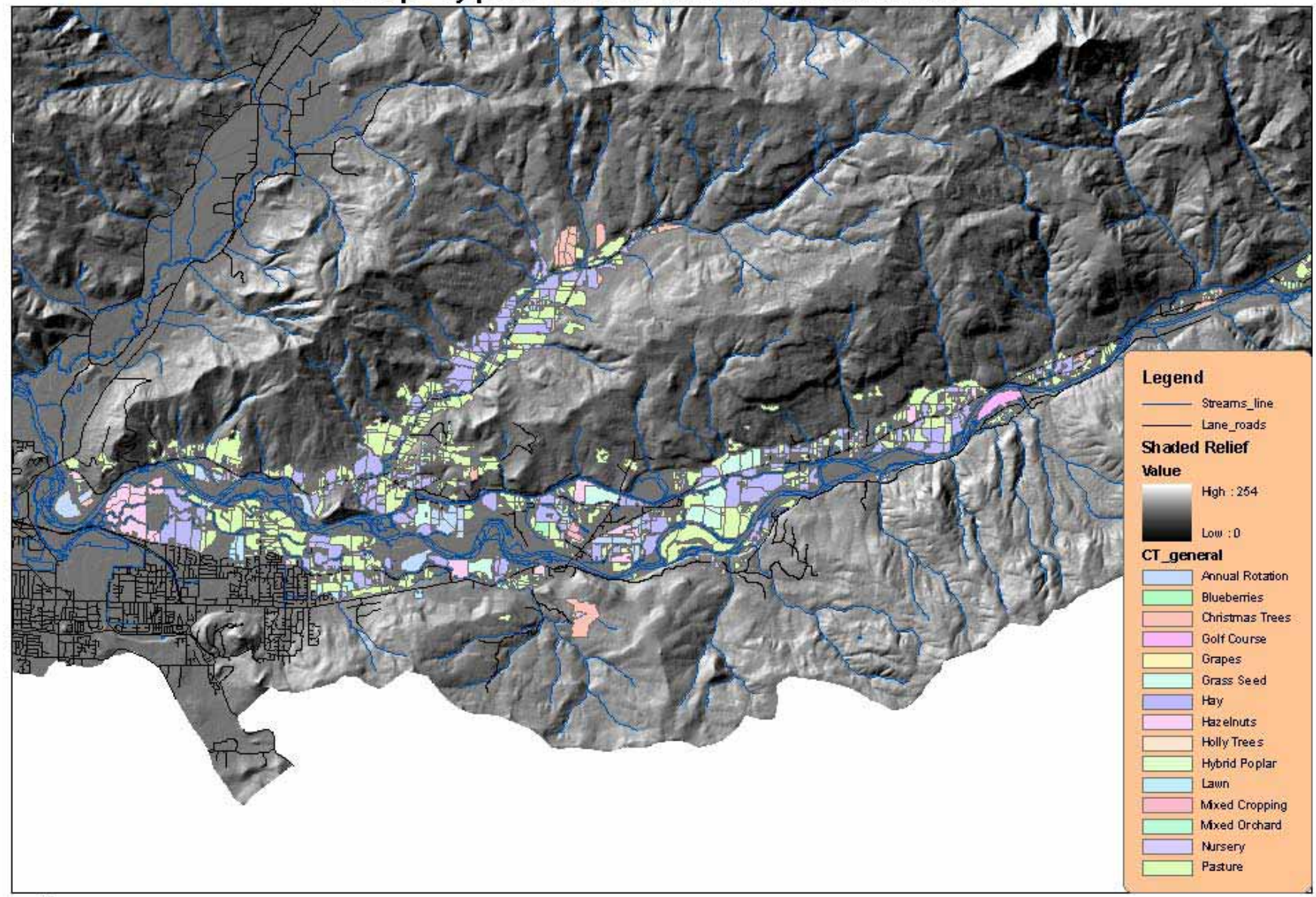
Agricultural Activities

- Quick overview to give you a sense of other source protection efforts.
- USFS & BLM involvement – wish us luck.

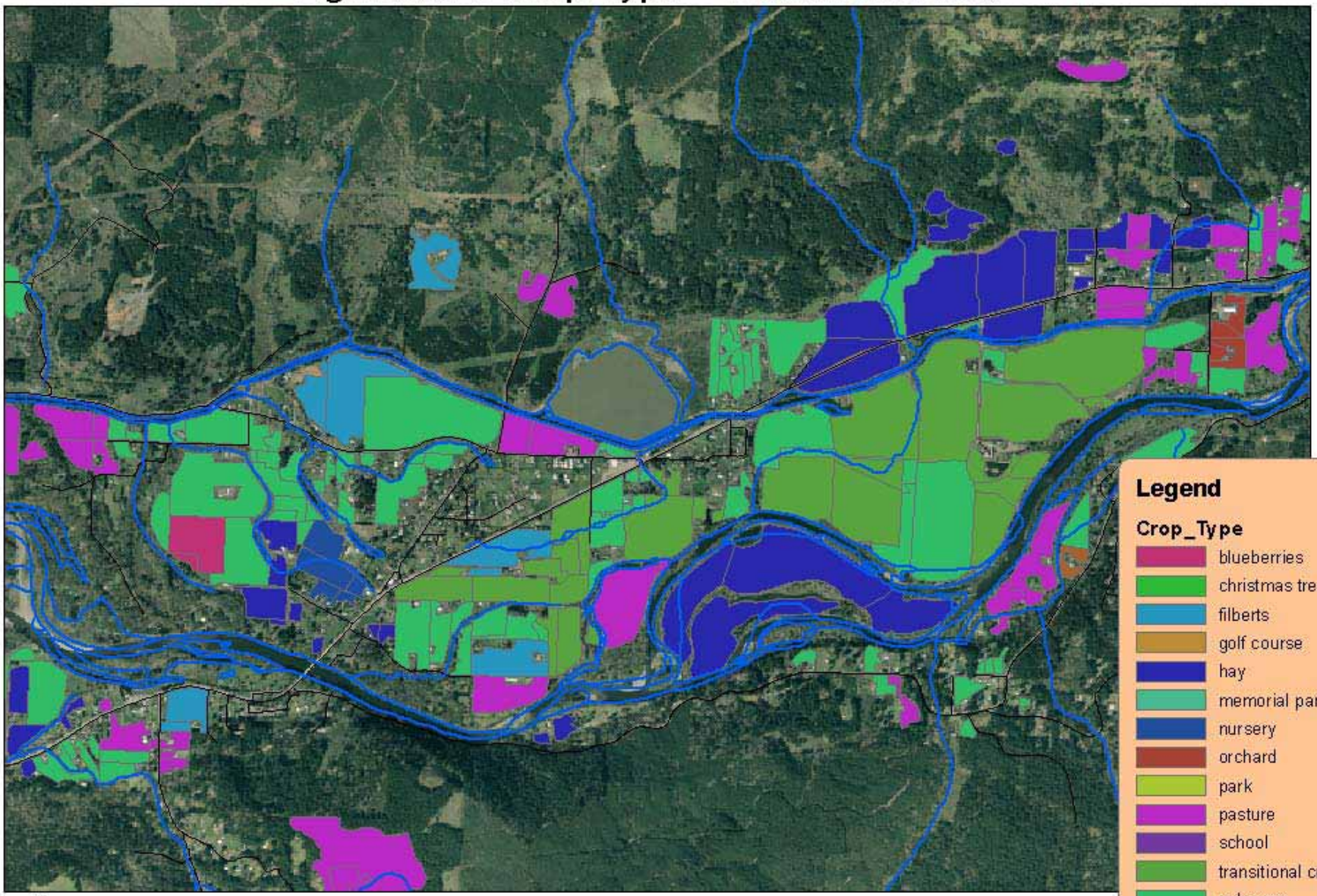
Protection Through Partnerships

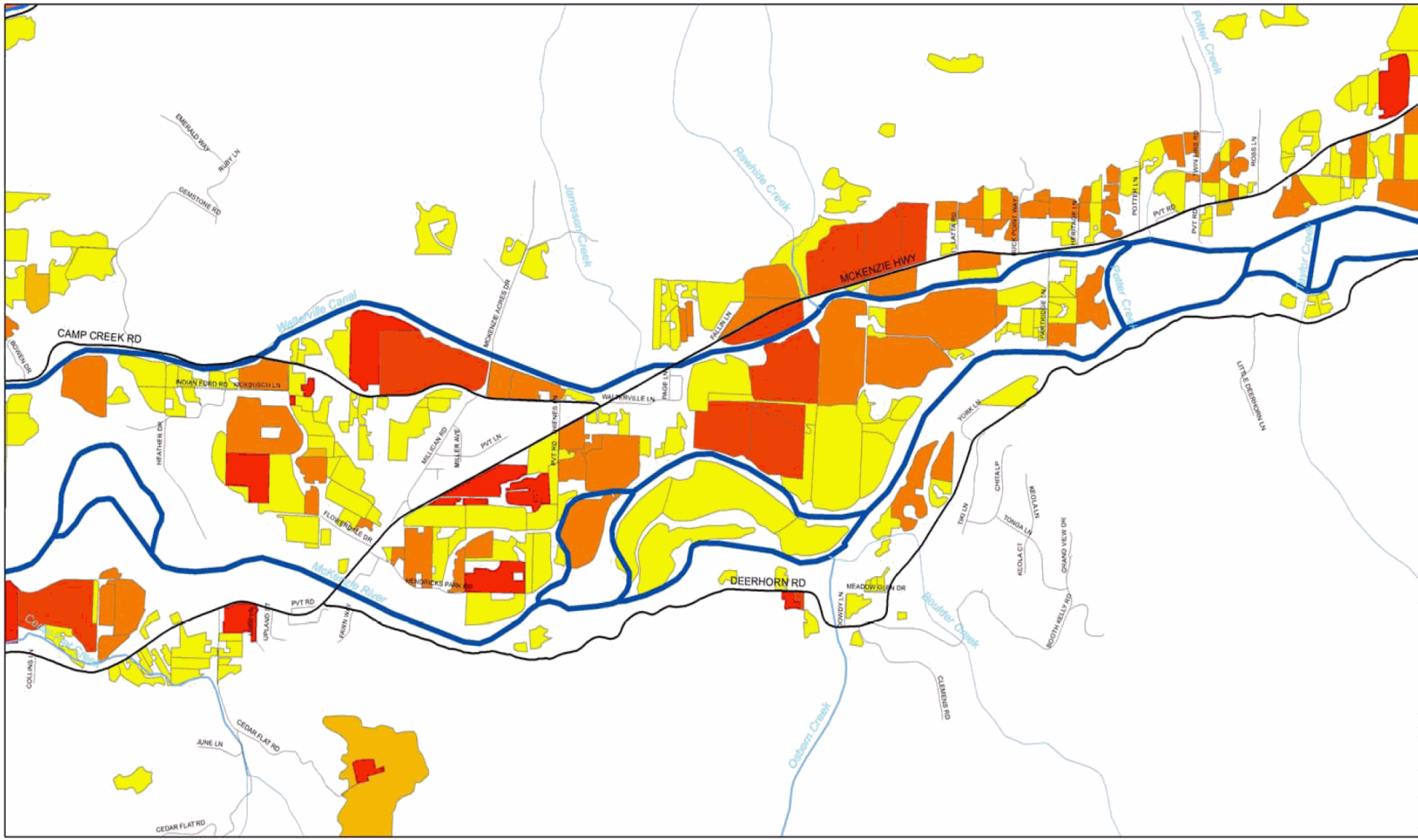
- Gain a better understanding of agricultural activities in the watershed…develop baseline information.
- Support agriculture as a preferred land use (development pressures, Measure 37).
- Establish long-term relationship to support existing agricultural programs and enhance economic viability.
- Through voluntary conservation actions reduce soil movement and pesticide runoff from fields.

Crop Types in McKenzie Watershed



Agriculture Crop Type - Walterville Area





McKenzie Watershed Agricultural Census

Total Pounds Per Acre of Pesticide Application

0.00 - 0.13 | 0.14 - 0.70 | 0.71 - 1.20 | 1.21 - 2.85 | 2.86 - 4.13

Sheet 3

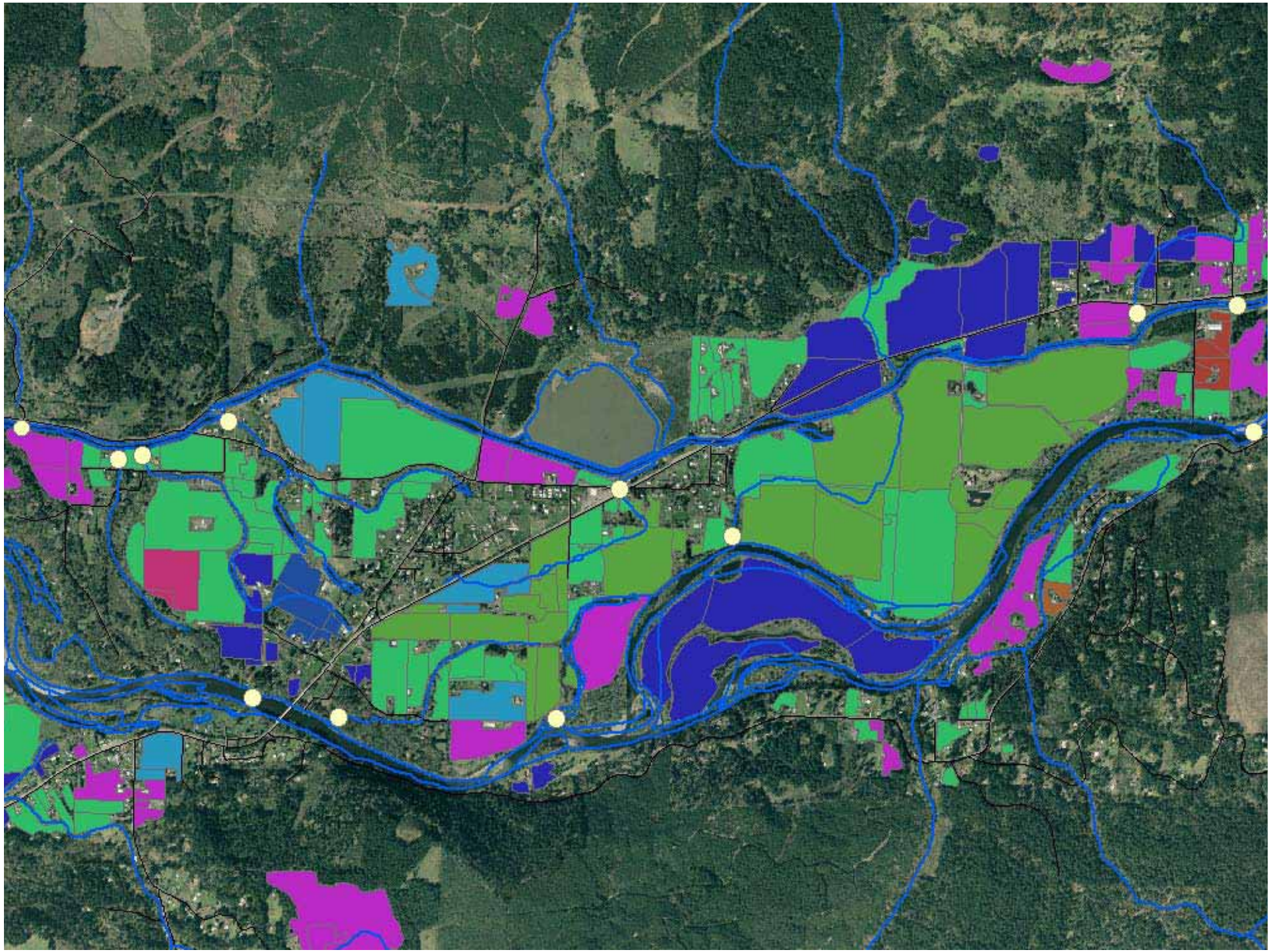
N

0 2,000 4,000 Feet

EWEB

LCOG Lane Council of Governments

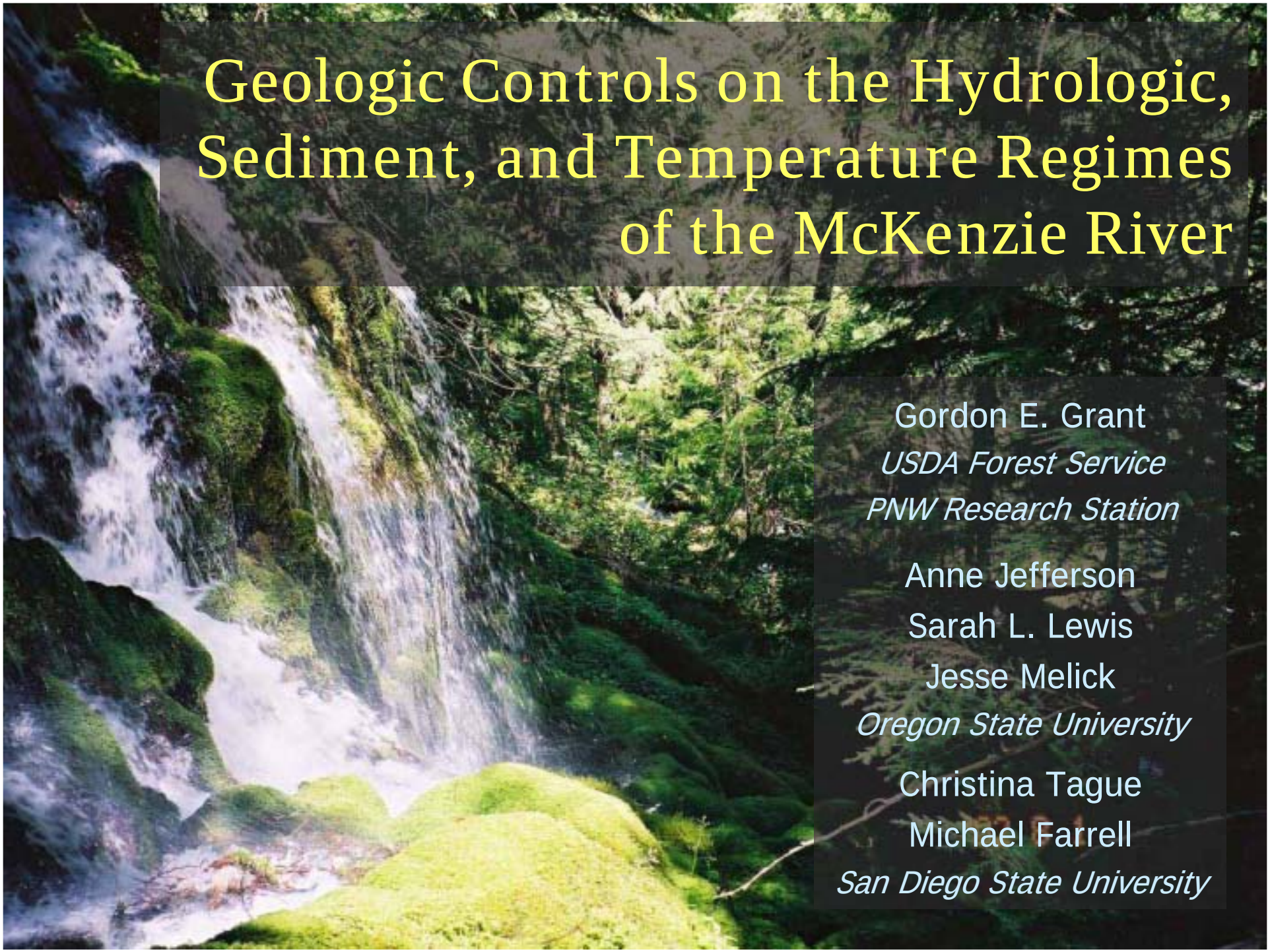
April 5, 2005




GLOBAL WARMING

EWEB Funded Research

- To understand the hydrologic “plumbing” of the McKenzie and its relationship with regional geology in order to predict/explain:
  - Seasonal and inter-annual variation of streamflow
  - Likely response of the river and water supply to climate change (i.e., degree of hydrologic “buffering” or resiliency)
  - Controls on sediment and temperature regimes

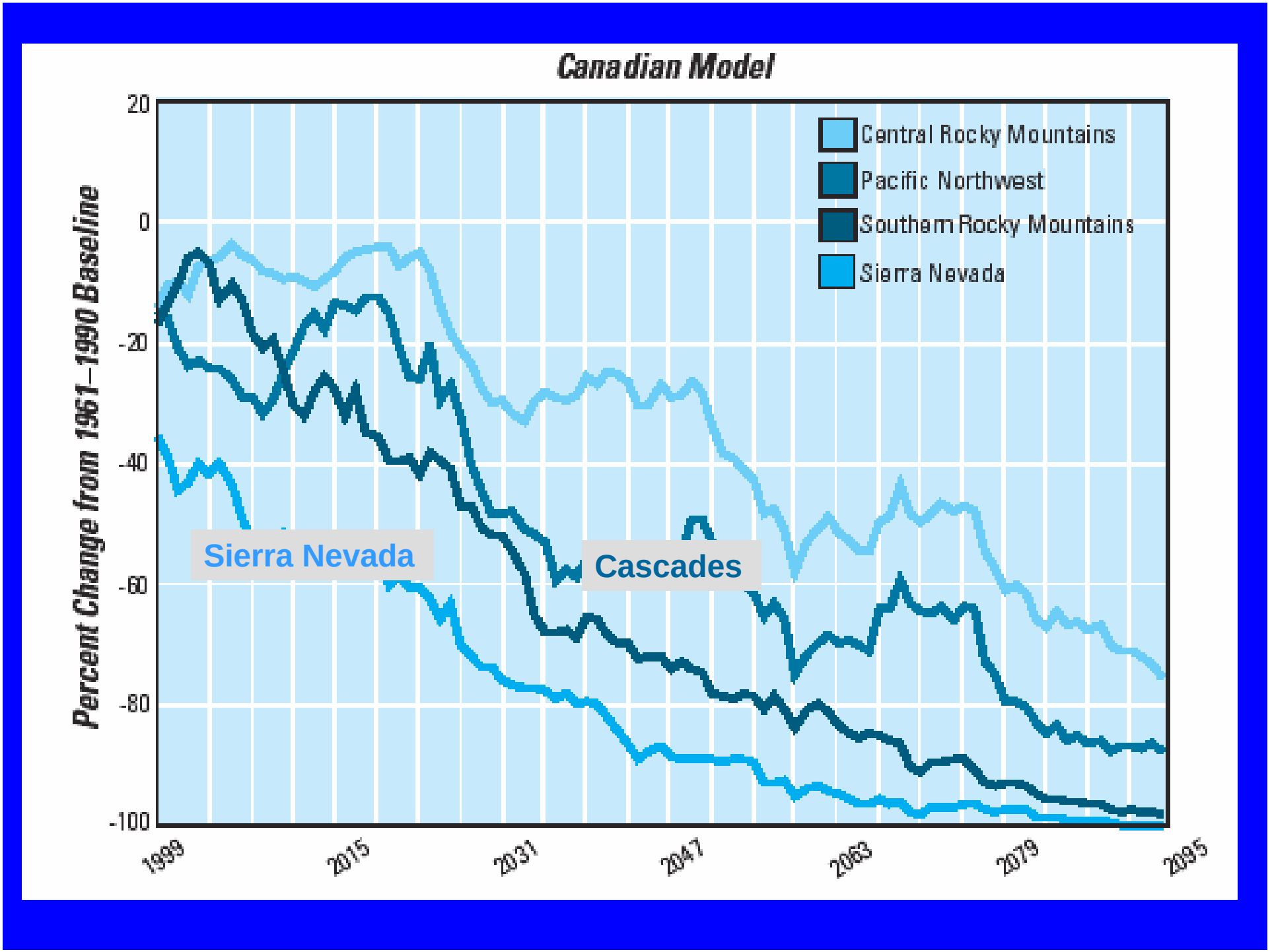


Geologic Controls on the Hydrologic, Sediment, and Temperature Regimes of the McKenzie River

Gordon E. Grant
USDA Forest Service
PNW Research Station

Anne Jefferson
Sarah L. Lewis
Jesse Melick
Oregon State University

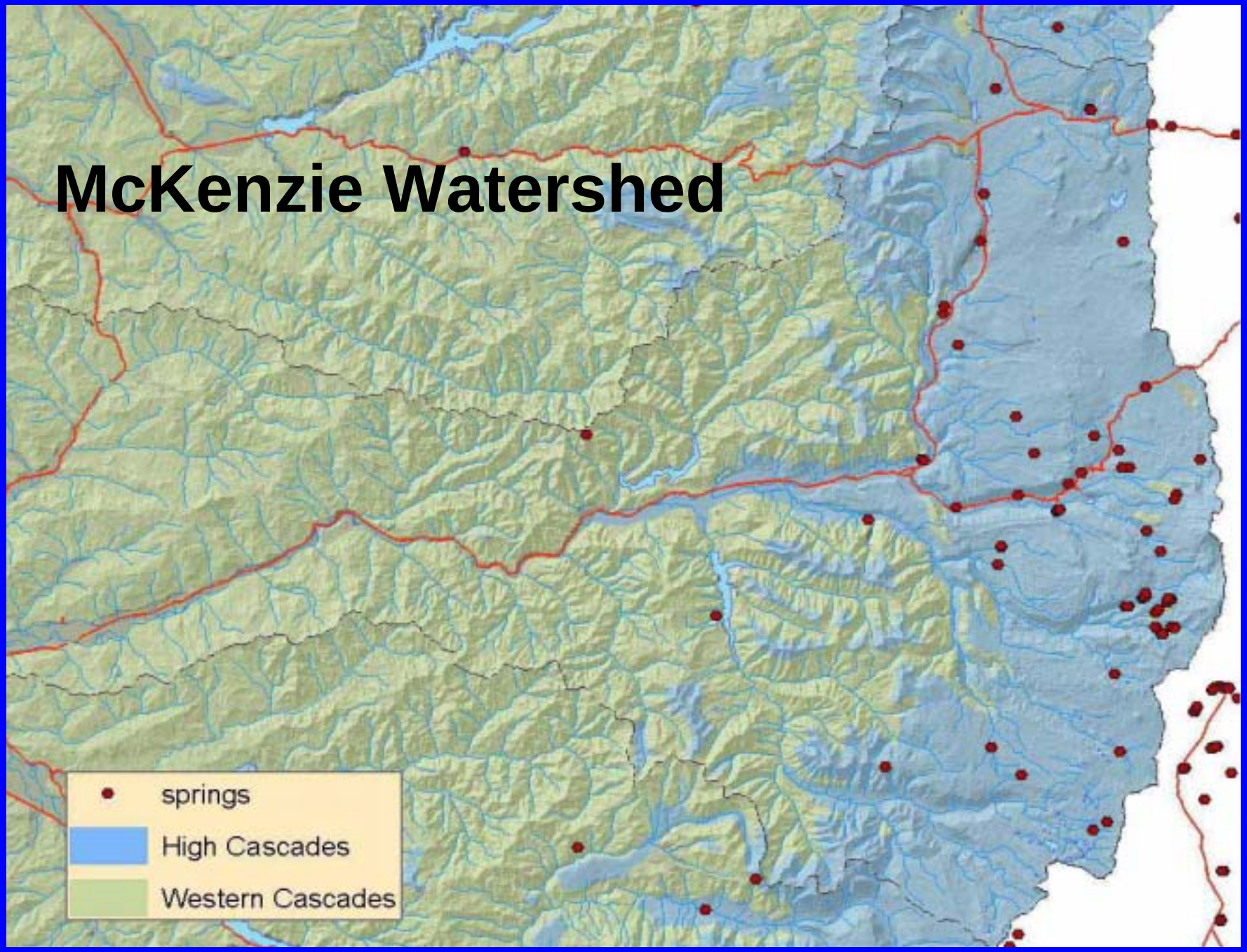
Christina Tague
Michael Farrell
San Diego State University

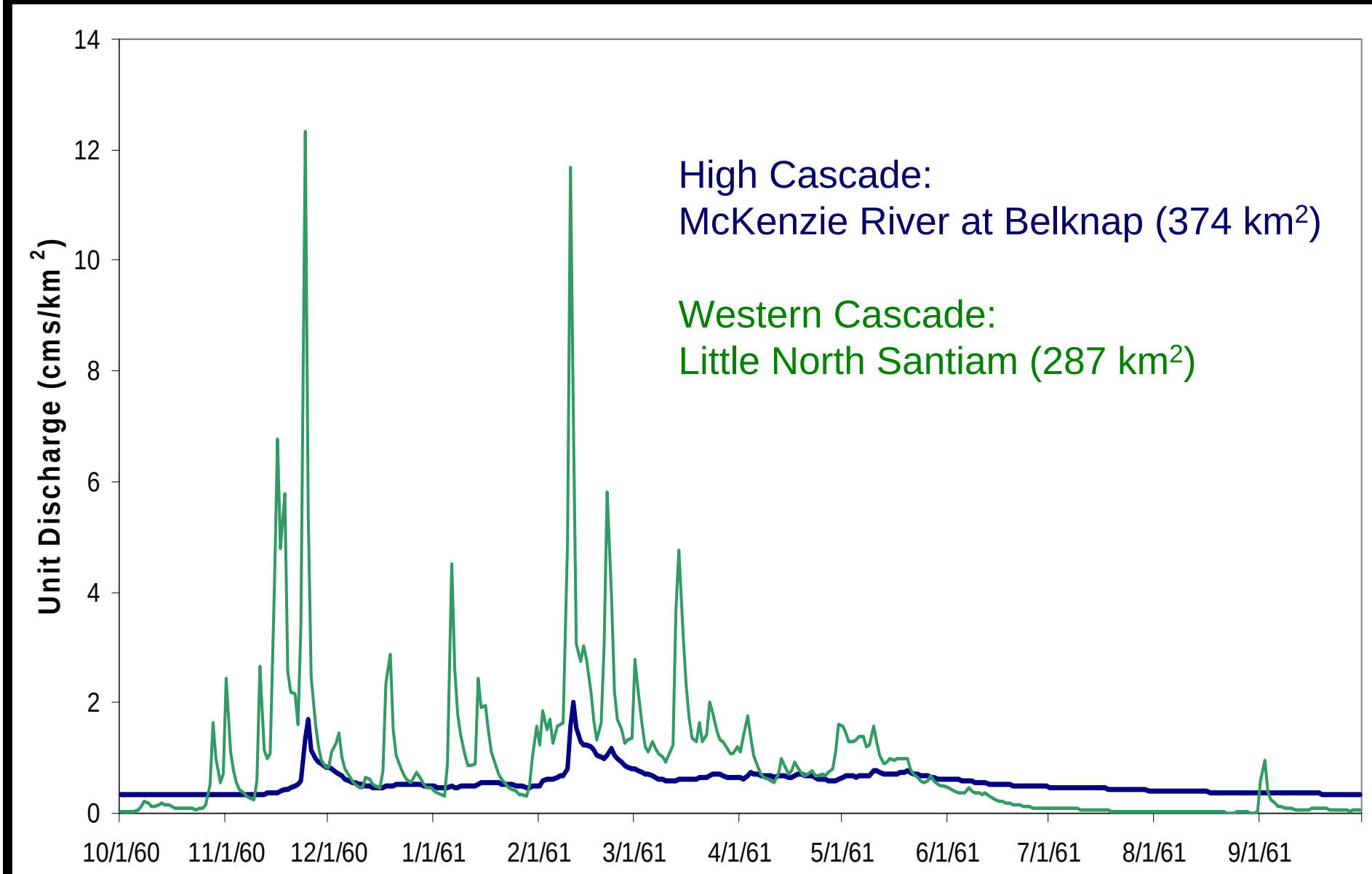

Canadian Model
Percent Change from 1961–1990 Baseline
20
0
-20
-40
-60
-80
-100
1999
2015
2031
2047
2063
2079
2095
Central Rocky Mountains
Pacific Northwest
Southern Rocky Mountains
Sierra Nevada
Sierra Nevada
Cascades

Likely future summer water supply:

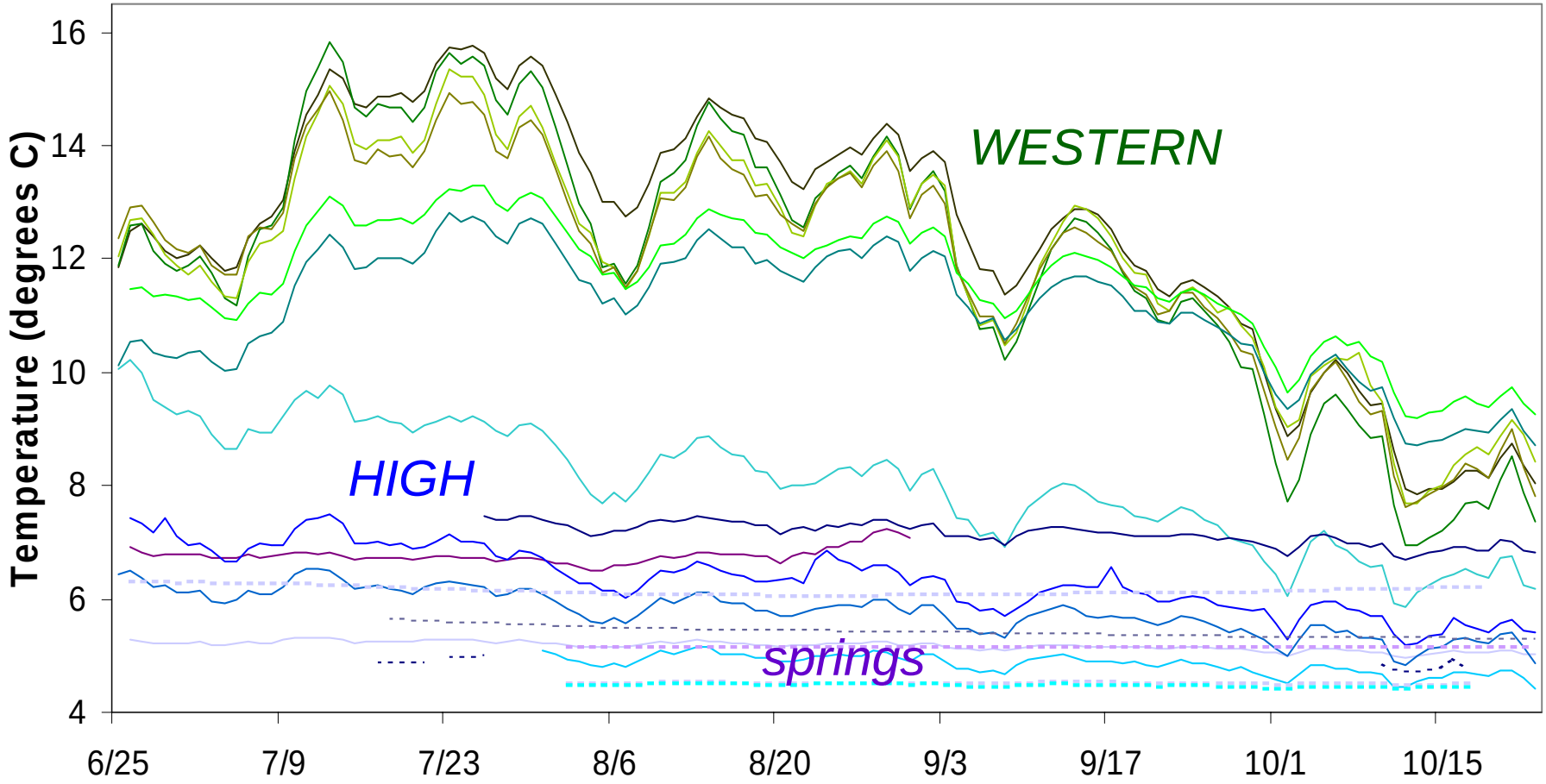
Sustained, due to groundwater storage

Greatly diminished, due to loss of snowpack


McKenzie Watershed
springs
High Cascades
Western Cascades

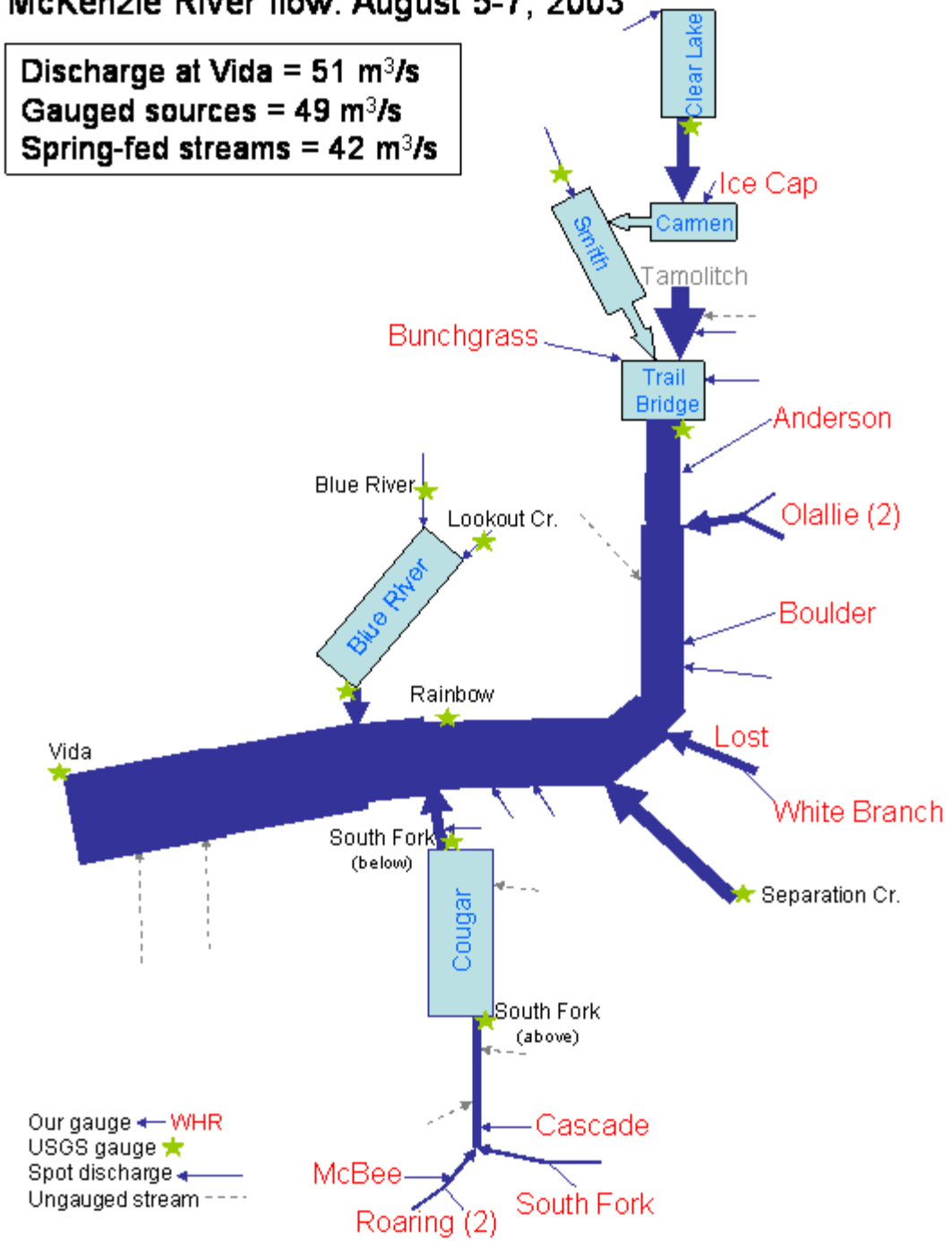

Unit Discharge (cms/km 2)
14
12
10
8
6
4
2
0
10/1/60
11/1/60
12/1/60
1/1/61
2/1/61
3/1/61
4/1/61
5/1/61
6/1/61
7/1/61
8/1/61
9/1/61
High Cascade:
McKenzie River at Belknap (374 km2)
Western Cascade:
Little North Santiam (287 km2)

Measured Temperatures from Cascade Streams
Summer 2002



McKenzie River flow: August 5-7, 2003

Discharge at Vida = 51 m^3/s
Gauged sources = 49 m^3/s
Spring-fed streams = 42 m^3/s

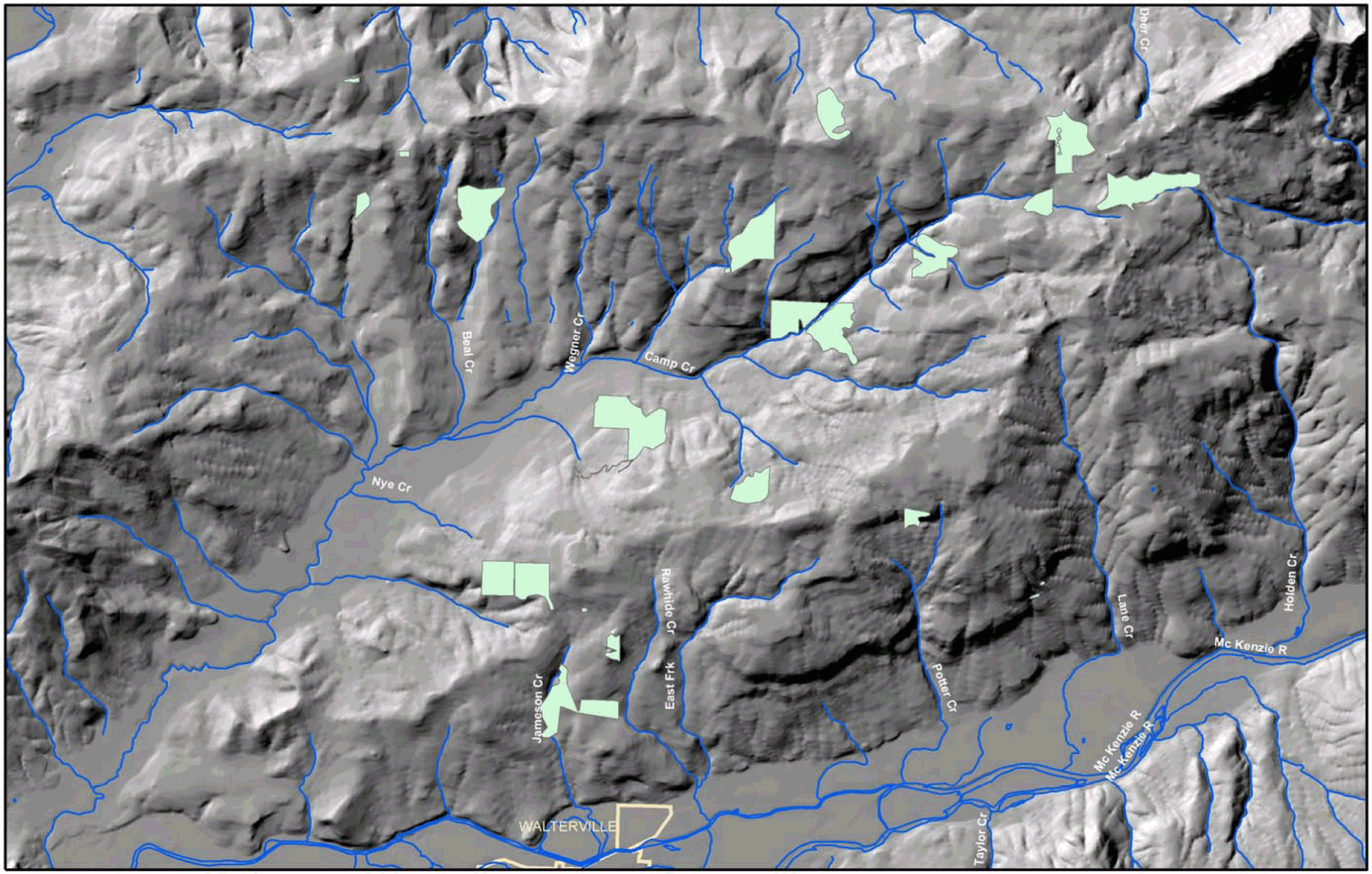


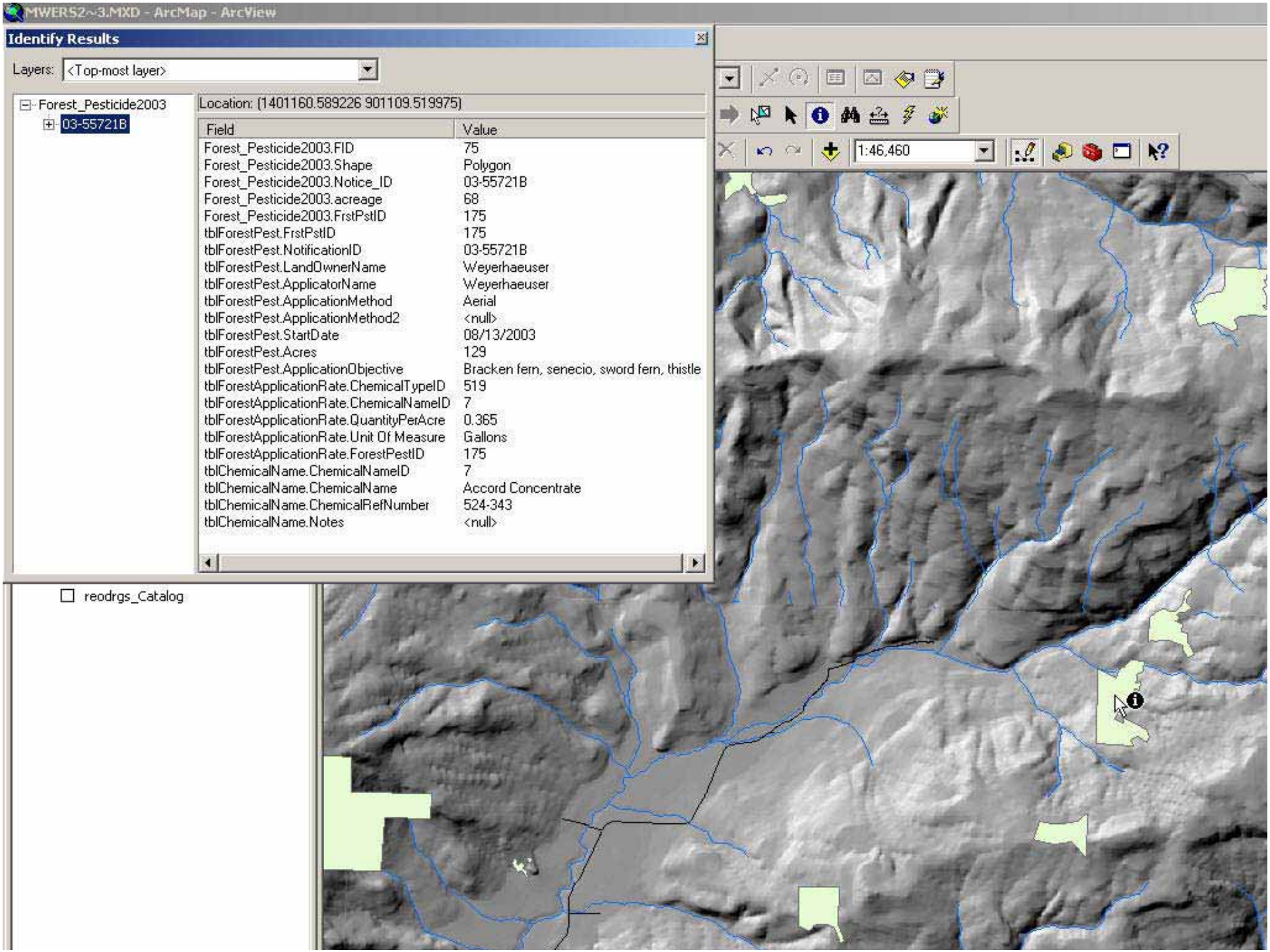
Forest Management Activities

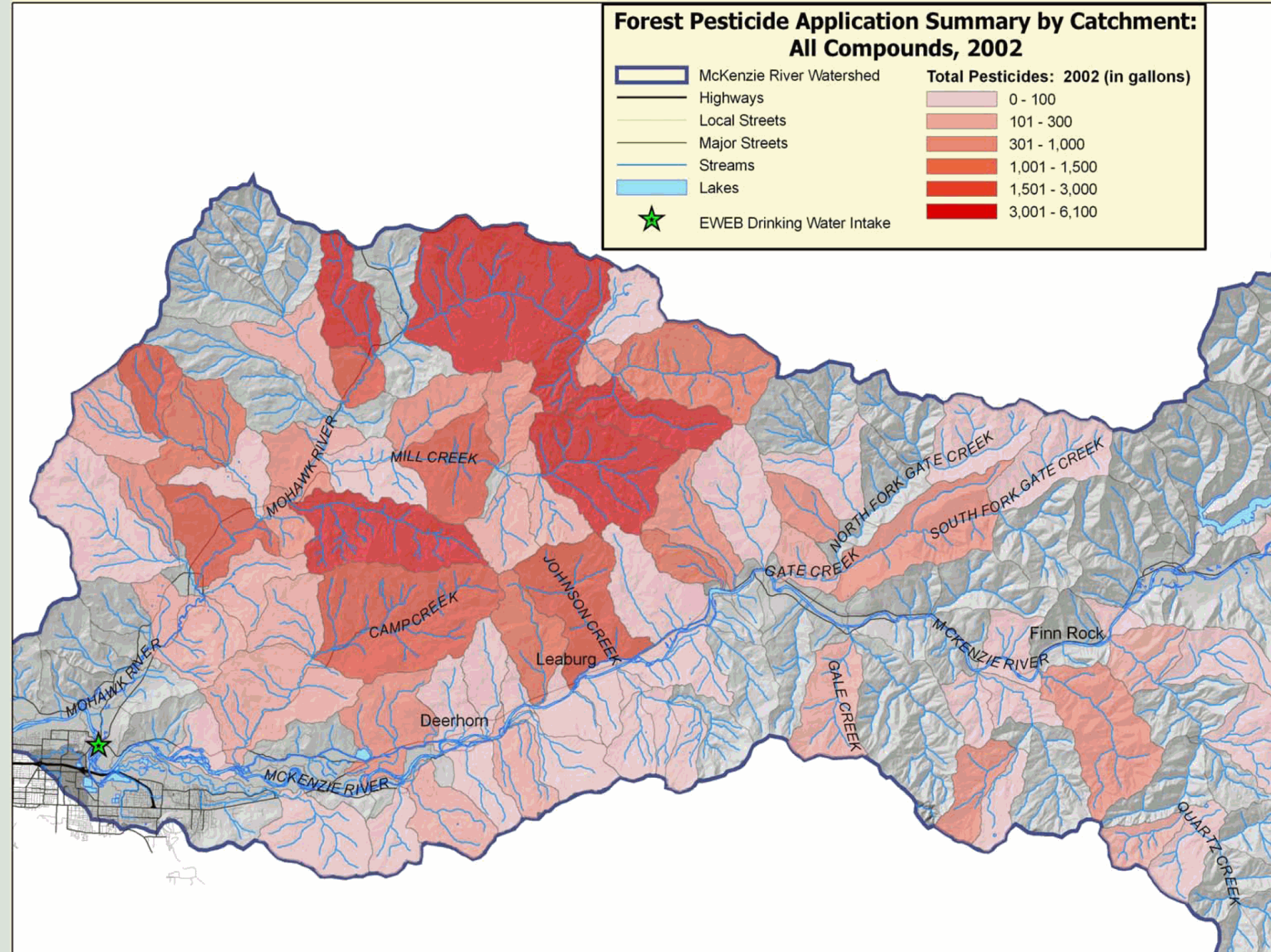
Forest Management

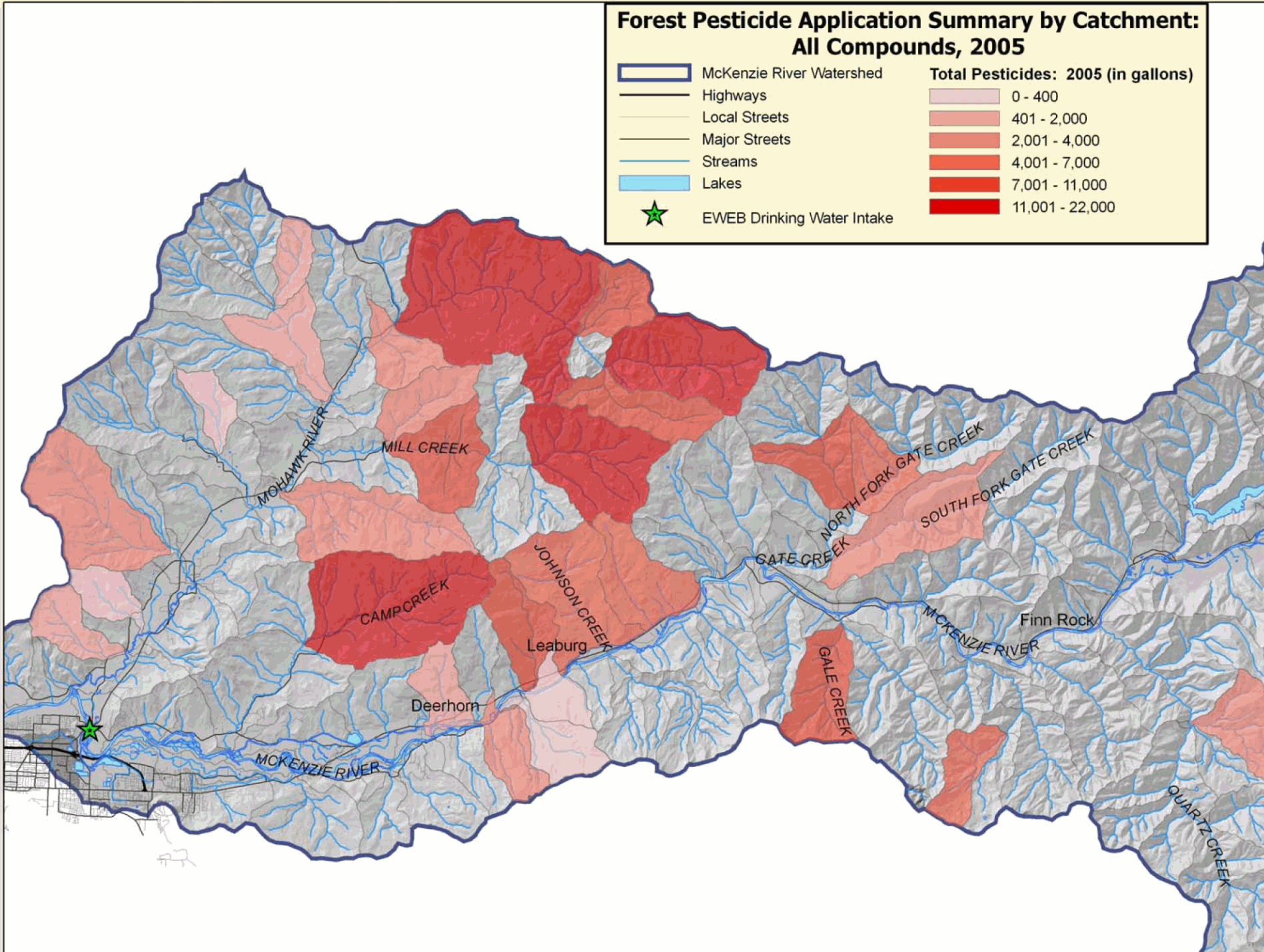
- Approximately 88% of the watershed is forested (68% federal; 20% private).
- Well known fact: “Forested watersheds produce best water quality of any other source”.
- Potential threats include timber harvest, road building, & chemical applications.
- Focus on one activity: aerial spraying of pesticides.

Forest Management Activities: Aerial Pesticide Application in 2002




MWERS2~3.MXD - ArcMap - ArcView
Identify Results
Layers: <Top-most layer>
Forest_Pesticide2003
03-55721B
Location: (1401160.589226 901109.519975)
Field
Value
Forest_Pesticide2003.FID 75
Forest_Pesticide2003.Shape Polygon
Forest_Pesticide2003.Notice_ID 03-55721B
Forest_Pesticide2003.acreage 68
Forest_Pesticide2003.FrstPstID 175
tblForestPest.FrstPstID 175
tblForestPest.NotificationID 03-55721B
tblForestPest.LandOwnerName Weyerhaeuser
tblForestPest.ApplicatorName Weyerhaeuser
tblForestPest.ApplicationMethod Aerial
tblForestPest.ApplicationMethod2 <null>
tblForestPest.StartDate 08/13/2003
tblForestPest.Acres 129
tblForestPest.ApplicationObjective Bracken fern, senecio, sword fern, thistle
tblForestApplicationRate.ChemicalTypeID 519
tblForestApplicationRate.ChemicalNameID 7
tblForestApplicationRate.QuantityPerAcre 0.365
tblForestApplicationRate.Unit Of Measure Gallons
tblForestApplicationRate.ForestPestID 175
tblChemicalName.ChemicalNameID 7
tblChemicalName.ChemicalName Accord Concentrate
tblChemicalName.ChemicalRefNumber 524-343
tblChemicalName.Notes <null>
1:46,460
reodrgs_Catalog


Forest Pesticide Application Summary by Catchment:
All Compounds, 2002
McKenzie River Watershed
Highways
Local Streets
Major Streets
Streams
Lakes
EWEB Drinking Water Intake
Total Pesticides: 2002 (in gallons)
0 - 100
101 - 300
301 - 1,000
1,001 - 1,500
1,501 - 3,000
3,001 - 6,100
MOHAWK RIVER
MILL CREEK
CAMP CREEK
JOHNSON CREEK
Leaburg
Deerhorn
MCKENZIE RIVER
GATE CREEK
NORTH FORK GATE CREEK
SOUTH FORK GATE CREEK
GALE CREEK
Finn Rock
QUARTZ CREEK


Forest Pesticide Application Summary by Catchment:
All Compounds, 2005
McKenzie River Watershed
Highways
Local Streets
Major Streets
Streams
Lakes
EWEB Drinking Water Intake
Total Pesticides: 2005 (in gallons)
0 - 400
401 - 2,000
2,001 - 4,000
4,001 - 7,000
7,001 - 11,000
11,001 - 22,000
MOHAWK RIVER
MILL CREEK
CAMP CREEK
JOHNSON CREEK
Leaburg
Deerhorn
MCKENZIE RIVER
GATE CREEK
NORTH FORK GATE CREEK
SOUTH FORK GATE CREEK
GALE CREEK
MCKENZIE RIVER
Finn Rock
QUARTZ CREEK

Forestry Approach

- Working with ODF, USFS, BLM and others to prepare for wild land fires to protect forests.
- Look to setup wild land fire assessment & response tool like spills response system.
- Work with forest industry to setup monitoring in high treatment basins.
- Explore long-term partnerships to reduce potential risks from aerial spraying while promoting forest products.

USFS - THE GOOD

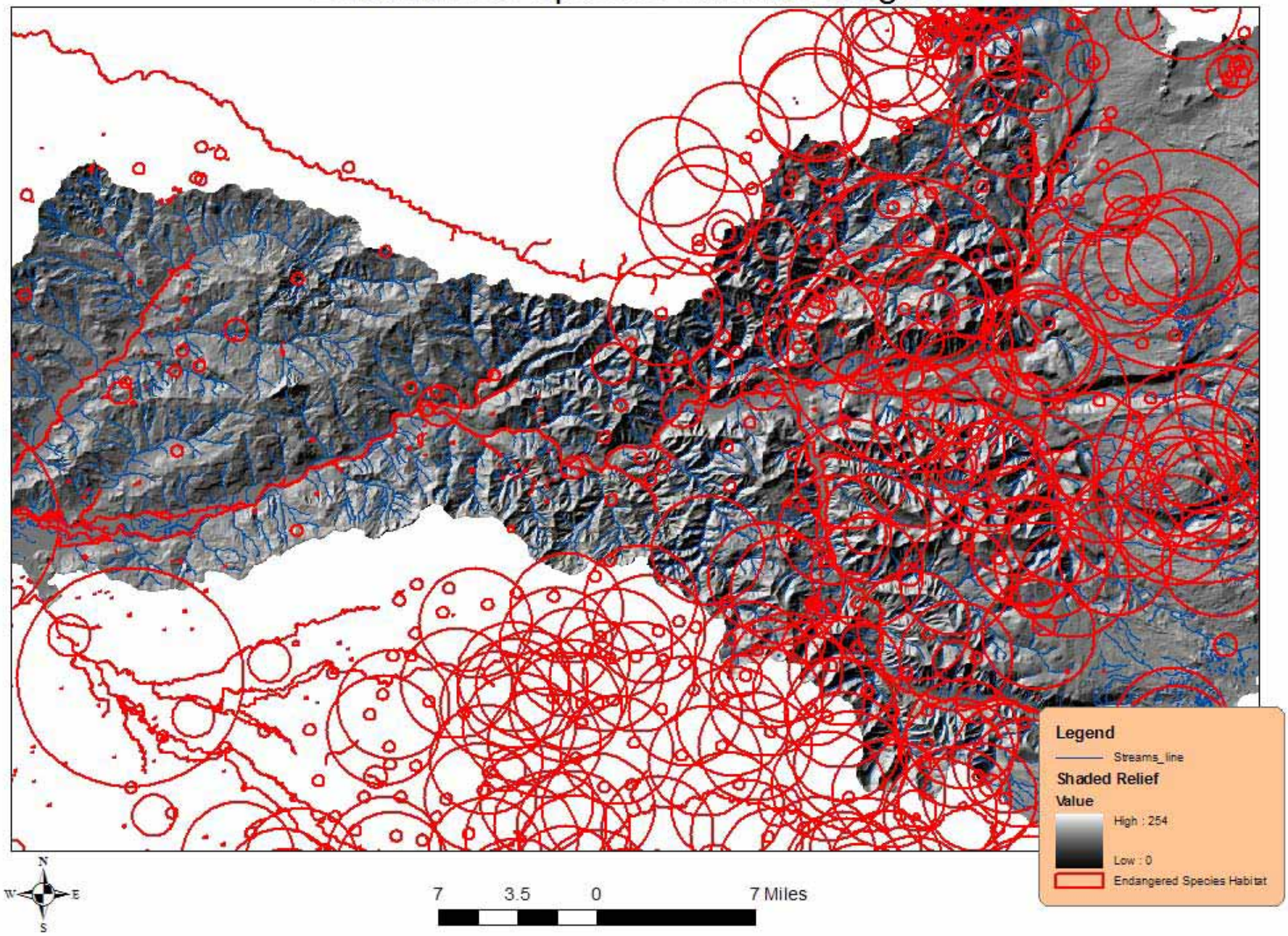
USFS Summary of The Good

- Active member of the MWC.
- Thoughtful harvests using adaptive management & research results (HJ Andrews).
- Reduction of forest roads.
- Wild land fire assessment & response capabilities.
- Insignificant pesticide use.
- A trusted partner in watershed management.

Summary of the Unfortunate

- Good stories to tell, but broken communications make insignificant issues large resource sinks.
- Penny wise pound foolish.
- ESA/Fish Centric
- All enemies and no friends.
- Use of fire retardants.

Endandered Species Habitat Ranges



The Future

- Informal relationships/better communications with watershed partners (not NEPA driven).
- Share information and data.
- Look at watershed approach to timber harvests (take pressure off commercial logging).
- Look for opportunities for shared research.
- Setup interagency watershed monitoring.
- Protect The Source!

McKenzie – EWEB's Life Blood